

Before the Hearings Commissioners

Under the Resource Management Act 1991 (the **RMA**)

In the matter of a submission by KiwiRail Holdings Limited (submitter S43 and further submitter FS12) and NZ Transport Agency Waka Kotahi (submitter S50 and further submitter FS10) on the Upper Hutt City Council Intensification Planning Instrument

and in the matter of Upper Hutt City Council District Plan

**Primary statement of evidence of Catherine Lynda Heppelthwaite for
KiwiRail Holdings Limited and NZ Transport Agency Waka Kotahi
regarding Upper Hutt City Council Intensification Planning
Instrument**

Dated 19 April 2023

1 INTRODUCTION, QUALIFICATIONS AND EXPERIENCE

- 1.0 My full name is Catherine Lynda Heppelthwaite. I am a principal planner for Eclipse Group Limited. I am presenting this planning evidence on behalf of KiwiRail Holdings Limited (**KiwiRail**) and NZ Transport Agency Waka Kotahi (**Waka Kotahi**).
- 1.1 I hold a Bachelor Degree in Resource Studies obtained from Lincoln University in 1993. I am a full member of the New Zealand Planning Institute, a member of the Resource Management Law Association and the Acoustical Society of New Zealand. I have more than 25 years' experience within the planning and resource management field which has included work for local authorities, central government agencies, private companies and private individuals. Currently, I am practicing as an independent consultant planner and have done so for the past 18 years.
- 1.2 I have extensive experience with preparing submissions and assessing district plans provisions in relation to noise and vibration, most recently in relation to the New Plymouth, Porirua and Whangarei District Plans where I assisted Waka Kotahi by providing specialist planning evidence on similar issues (noise and vibration).

2 CODE OF CONDUCT

- 2.0 I have read the Environment Court's Code of Conduct for Expert Witnesses (2023) and I agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues addressed in this brief of evidence are within my areas of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

3 SCOPE OF EVIDENCE

- 3.0 My evidence will address the following:
- a. The statutory and higher order planning framework;
 - b. KiwiRail and Waka Kotahi submissions;
 - c. Councils s42A recommendations; and
 - d. Further amendments required.

3.1 In preparing my evidence, I have considered the Section 42A Hearings Report prepared by Mr Matt Muspratt¹ and evidence on which he has relied from Mr Wignall².

4 THE STATUTORY AND HIGHER ORDER PLANNING FRAMEWORK

4.0 In preparing this evidence I have specifically considered the following:

- a. The purpose and principles of the RMA (sections 5-8);
- b. Provisions of the RMA relevant to plan-making and consenting;
- c. National Policy Statement on Urban Development 2020 (**NPS UD**);
- d. Wellington Regional Policy Statement (**RPS**) with specific reference to:
 - i. Chapter 3.3 Introductory Text:
 - Recognising rail as a significant physical resource³;
 - *The efficient use and development of such infrastructure can be adversely affected by development. For example, **land development can encroach on infrastructure or interfere with its efficient use**. Infrastructure can also have an adverse effect on the surrounding environment. For example, the operation or use of **infrastructure can create noise which may adversely impact surrounding communities**. These effects need to be balanced to determine what is appropriate for the individual circumstances⁴.*[bold added]
 - ii. Objective 10: *The social, economic, cultural and environmental, benefits of regionally significant infrastructure are recognised and protected⁵.*
 - iii. Policy 8: *Protecting regionally significant infrastructure – regional and district plans⁶. District and regional plans **shall include policies and rules that protect regionally significant infrastructure from***

¹ Dated 6 April 2023.

² Evidence of Donald Wignall, 6 April 2023.

³ RPS Introductory text, 3.3 Energy, infrastructure and waste, page 44(b) *Infrastructure*.

⁴ RPS Introductory text, 3.3 Energy, infrastructure and waste, page 44(b) *Infrastructure*.

⁵ RPS Table 3: Energy, infrastructure and waste objectives and titles of policies and methods to achieve the objectives.

⁶ RPS Table 3: Energy, infrastructure and waste objectives and titles of policies and methods to achieve the objectives.

*incompatible new subdivision, use and development occurring under, over, or adjacent to the infrastructure*⁷. **[bold added]**

- iv. Policy 8 Explanation: *Incompatible subdivisions, land uses or activities are those which **adversely affect the efficient operation of infrastructure**, its ability to give full effect to any consent or other authorisation, restrict its ability to be maintained, or restrict the ability to upgrade where the effects of the upgrade are the same or similar in character, intensity, and scale. **It may also include new land uses that are sensitive to activities associated with infrastructure.***

*Protecting regionally significant infrastructure **does not mean that all land uses or activities under, over, or adjacent are prevented.** The Wellington Regional Council and city and district councils will need to ensure that **activities provided for in a district or regional plan are compatible** with the efficient operation, maintenance, and upgrading (where effects are the same or similar in character, intensity, and scale) of the infrastructure and any effects that may be associated with that infrastructure. Competing considerations need to be weighed on a case by case basis to determine what is appropriate in the circumstances*⁸. **[bold added]**

- v. Method 1 (for Policy 8) identifies district plans as an implementation method⁹.

4.1 Mr Muspratt has addressed¹⁰ identified the relevant statutory, planning and strategic document provisions with which I generally agree and will not repeat here. I have also considered Plan Change 1 to the Wellington Regional Policy Statement and have given this minimal weighting due to its progression through the Schedule 1 process.

4.2 For KiwiRail, The Emissions Reduction Plan is a matter to be had regard to by Council¹¹; of particularly relevance within the Emissions Reduction Plan (for

⁷ RPS Page 96.

⁸ RPS Page 96.

⁹ RPS Table 3: Energy, infrastructure and waste objectives and titles of policies and methods to achieve the objectives.

¹⁰ S42A Report, Section 9.1 and referenced Section 32 Evaluation Report.

¹¹ RMA Section 74(2)(d).

rail) is *Action 10.3.1: Support the decarbonisation of freight* which includes as a key initiative:

- *Continue to implement the New Zealand Rail Plan and support coastal shipping.*

4.3 For completeness, the New Zealand Rail Plan (NZRP) lists as strategic investment priorities:

- *Investing in the national rail network to restore rail freight and provide a platform for future investments for growth; and*
- *Investing in metropolitan rail to support growth and productivity in our largest cities.*

4.4 While the Emissions Reduction Plan is *to be had regard to*, its support for the NZRP (among other things) illustrates a strategic forward plan to generally improve and increase train services over time.

5 KIWIRAIL SUBMISSIONS AND FURTHER SUBMISSIONS

5.0 In summary, KiwiRail's primary submission seeks:

- a. that rail be identified as a qualifying matter pursuant to s771(e) and s770(e) of the RMA; and
- b. the permitted activity standards in the General Residential Zone (**GRZ**), High Density Residential Zone (**HDRZ**), Neighbourhood Centre Zone (**NCZ**), Local Centre Zone (**LCZ**), Mixed Use Zone (**MUZ**), Town Centre Zone (**TCZ**), and City Centre Zone (**CCZ**) (and any other zones affected by the IPI which adjoin the rail corridor) be amended to increase the minimum setback for sites that adjoin the rail corridor from 1m to 5m; and
- c. a new matter of discretion be inserted in the zones listed in (b) above (and any other zones affected by the IPI which adjoin the rail corridor) directing consideration of impacts on the safety and efficiency of the rail corridor in situations where the 5m setback standard is not complied with;
- d. an objective and policy in the Noise Chapter to avoid where practicable, or otherwise remedy or mitigate, adverse effects of subdivision, use and development on regionally significant network utilities. Alternative relief

was also sought to include the same objective and policy in each relevant zone (including NCZ-P2, LCZ-P2, MUZ-P2 and TCZ-P2);

- e. the following provisions are included in the Noise Chapter (or in all relevant zones adjoining the rail corridor):
 - i. a permitted activity standard requiring acoustic insulation and ventilation apply to all new (and altered) activities sensitive to noise within 100m of the rail corridor;
 - ii. a permitted activity vibration standard be inserted for all new (and altered) activities sensitive to noise within 60m of the rail corridor to ensure that vibration effects are appropriately addressed; and
 - iii. a restricted discretionary activity status where the above noise and vibration standards are not complied with and corresponding matters of discretion.
- f. Changes to the definition of *qualifying matter* and a new definition of *activities sensitive to noise* to support the submissions; and;
- g. Submissions in support of a range of provisions.

5.1 KiwiRail has also made the further submissions which generally oppose Kainga Ora submissions¹² that are seeking to remove notification requirements where standards are not met and remove matters of discretion on consultation and consent notice requirements. Mr Muspratt has rejected¹³ Kainga Ora changes to remove limited notification or rejected/accepted in part¹⁴ submission to remove consent notices and consultation. I support his position and do not address these further.

¹² Kainga Ora submission points S58.37, S58.39, S58.57, S58.58, S58.61 and S58.132.

¹³ For example, Section 42A Report section 14.13, recommendation 3.

¹⁴ For example, Section 42A Report, paragraph 329.

6 WAKA KOTAHI SUBMISSIONS AND FURTHER SUBMISSIONS

6.0 In summary, the Waka Kotahi primary submission seeks:

- a. Changes to and support for a wide range of provisions to incorporate active and public transport within objectives and policies;
- b. Modifications and support for provisions on financial contributions;
- c. Inclusion of St Patrick's Estate Precinct as a Qualifying Matter with commensurate planning controls;
- d. Changes to access standards (TP-R3 and TP-S1);
- e. Broadening the extent of walkable catchments around train stations, City Centre and Town Centre zones to 800m and 200m-400m for the Local Centre zone; and
- f. Controls to manage noise effects on new or altered noise sensitive activities established alongside state highways.

6.1 Waka Kotahi has also made further submissions in opposition to a range of Kainga Ora submissions¹⁵ seeking to remove limited notification and modify as matters of discretion on consultation. Mr Muspratt has rejected¹⁶ changes to remove limited notification and rejected/accepted in part¹⁷ submissions to remove consultation. I support his position and do not address these further.

6.2 Waka Kotahi supported in part Silverstream Land Holdings Limited submission seeking to, among other things, rezone St Patrick's Estate Precinct to Mixed Use¹⁸. Waka Kotahi supported the rezoning subject to the development of a structure plan that appropriately considers infrastructure provision for the entire site, including provision for active transport modes. St Patrick's Estate Precinct is discussed further in Section 12.

6.3 Waka Kotahi also opposed changes sought by Retirement Villages Association of New Zealand¹⁹ (RVANZ) to allow retirement villages permitted (rather than discretionary) activities in a range of zones. The RVANZ

¹⁵ For example Kainga Ora submission points S58.37, S58.57, S58.58 and S58.132.

¹⁶ For example, Section 42A Report section 14.13, recommendation 3.

¹⁷ For example, Section 42A Report, paragraph 329.

¹⁸ Silverstream Land Holdings Limited S62.1, S62.22 and S62.23.

¹⁹ For example Retirement Villages Association of New Zealand submission points S65.36, S65.72.

submissions are proposed to be rejected by Mr Muspratt²⁰, a position I support.

- 6.4 Waka Kotahi also made further submissions in support of KiwiRail's submission seeking a definition of activities sensitive to noise²¹, with an objective, policy, rules and matters of discretion seeking to manage noise effects from transport infrastructure.

7 SECTION 42A ASSESSMENT

KiwiRail

- 7.0 Mr Muspratt has either adopted KiwiRail's submissions or proposed alternative relief which I support in relation to the following:
- a. accepted modification to UDF Strategic Direction²² to include reference to HDR within the description²³;
 - b. retained UFD-O4²⁴, CMU-O1²⁵, HRZ-R1²⁶, SUB-HRZ-S2(6)²⁷, [TP-S1(5), SUB-HRZ- S2(6), and SUB-CMU- S1(5)²⁸] and definition of *reverse sensitivity*²⁹ as notified;
 - c. amended UFD-P2³⁰, SUB-HRZ-P2³¹, SUB-HRZ-P4³² and MUZ-P5³³ which were supported as notified by KiwiRail. The amendments proposed are, in my opinion, either appropriate as they retain the policies' intent or I agree with Mr Muspratt's reasons for changes.
- 7.1 Mr Muspratt has recommended not accepting the following submissions which I will address further in sections 8 to 11 below.
- d. Accept in part KiwiRail's proposed amendment to SUB-HRZ-O3 to include ensuring *the ongoing safe and efficient operation of transport networks*

²⁰ Section 42A Report, paragraph 301.

²¹ S43.3 and S43.15 to 43.17.

²² S43.6.

²³ Section 42A paragraph 180.

²⁴ S43.4.

²⁵ S43.7.

²⁶ S43.11.

²⁷ S43.10.

²⁸ S43.19.

²⁹ S43.2.

³⁰ S43.5.

³¹ S43.9.

³² S43.9.

³³ S43.12.

*and minimises potential reverse sensitivity effects*³⁴. Mr Muspratt has adopted reference to minimising reverse sensitivity but not the prefacing text to ensure *ongoing safe and efficient operation of transport networks*. His opinion is that ensuring the safe and efficient operation of the transport networks is not consistent with the permitted and controlled activity development enabled in walkable catchments³⁵. I interpret this to mean permitted and controlled development may have impacts on the safe and efficient operation of transport networks ‘as of right’ and therefore SUB-HRZ-O3 would not be able to be met. I agree with Mr Muspratt’s recommendation on this objective.

- e. Reject new objectives and policies in NCZ, LCZ, MUZ, TCZ, and CCZ³⁶ which support qualifying matter to protect from reverse sensitivity effects (building setback).
- f. Reject new rules within LCZ-S2, MUZ-S3 TCZ- S3 and CCZ- S2, NCZ- SSC- S1, GRZ-S3 which provide a 5m building setback³⁷. Mr Muspratt has some technical and principled reservations and effectively invited KiwiRail to provide additional information and justification for the requested provisions at the hearing³⁸.
- g. Reject new objectives and policies in Noise Chapter (or, in the alternative, provisions in zones adjoining the rail corridor)³⁹ to manage new buildings and additions to existing buildings containing noise sensitive activities on the basis that effects on regionally significant infrastructure are managed via existing provisions in the District-wide chapter⁴⁰ (particularly the Network Utilities chapter) and proposed Section 42A amendments to matters of discretion.
- h. Reject new rules, definition (changes to *qualifying matter* and new *noise sensitive activity*), associated standards and matters of discretion for the Noise chapter to manage new buildings and additions to existing buildings containing noise sensitive activities⁴¹.

³⁴ S43.8.

³⁵ Section 42A Report paragraph 521.

³⁶ S43.14.

³⁷ S43.13.

³⁸ Appendix 1 Recommendations on Submissions and Further Submissions, page 399.

³⁹ S43.15.

⁴⁰ Appendix 1 Recommendations on Submissions and Further Submissions, page 400.

⁴¹ S43.1, S43.3, S43.16, S43.17 and S43.18.

7.2 Mr Muspratts' reasons for rejecting submissions outlined in (e) to (h) are addressed in Section 32.2⁴² of his Section 42A Report and I will address these in detail in sections 8 to 11 below.

Waka Kotahi

7.3 Mr Muspratt has responded to the Waka Kotahi submissions as described below and where these require no further commentary, I have noted this.

- a. Accepted relief or more proposed alternatives for reasons I agree with in relation to UFD-P1⁴³, CMU-O3⁴⁴, SUB-HRZ-P4⁴⁵, DC-P1, DC-R2B⁴⁶, PK-P4⁴⁷, GRZ-P9⁴⁸, HRZ-O4, HRZ-P6, HRZ-P7⁴⁹ and inclusion of Design Guides for Medium and High Density⁵⁰
- b. For TP-R3⁵¹ and TR-S1⁵² (seeking to ensure access standards are appropriate applied); I agree with Mr Muspratts explanation⁵³ and the detailed assessment made by Mr Wignall⁵⁴ that existing provisions will apply and no amendment is needed in response to these submissions.
- c. Rejected submissions seeking to add to objectives NCZ-03, LCZ-O3, MUZ-O3 and TCZ-O3⁵⁵ wording which includes connection to active and public transport. Mr Muspratt recommends⁵⁶ that these are not accepted as the focus of the objective is to manage zone interface effects. I agree with his opinion.
- d. Rejected changes to CCZ-P1⁵⁷ and accepted changes to CCZ-P4⁵⁸ which both seek to add access to active and public transport reference to the policies. While I do not agree with the reasons Mr Muspratt has given⁵⁹ for rejecting changes to CCZ-P1, I do agree that the proposed

⁴² Section 42A Report, commencing at paragraph 1109.

⁴³ S50.8.

⁴⁴ S50.10.

⁴⁵ S50.14. Note the submission refers to this as SUB-HRZ-P2 (error).

⁴⁶ S50.15.

⁴⁷ S50.16.

⁴⁸ S50.17.

⁴⁹ S50.18 (same submission number for HRZ-O4, HRZ-P6, HRZ-P7).

⁵⁰ S50.25.

⁵¹ S50.11.

⁵² S50.12.

⁵³ Section 42A Report paragraphs 1053 and 1054.

⁵⁴ Evidence of Donald Wignall, 6 April 2023, paragraphs 35 to 48.

⁵⁵ S50.20

⁵⁶ Section 42A Report, paragraph 762.

⁵⁷ S50.23.

⁵⁸ S50.24.

⁵⁹ Section 42A Report, paragraph 609.

amendment to CCZ-P4⁶⁰ suitably addresses the need to recognise active and public transport within the CCZ policy framework and that a further change to CCZ-P1 is not necessary.

- e. SUB-HRZ-02⁶¹ [para 512], agree with change to include *accessible* but not limit the objective to *for all modes and users*. I consider with Mr Muspratt's view⁶² that including "all modes and users" is at odds with the broader focus of the objective on all infrastructure.
- f. Rejected changes to UFD-O3⁶³, which generally sought inclusion of active transport, bus routes and/or removal of walkability. I accept Mr Muspratt's view⁶⁴ on this as OFD-O3 relates directly to identifying High Density Residential Zones under NPSUD Policy 3 which refers directly to 'walkability'. I consider UFD-P1 addresses accessibility by active and public modes.
- g. Rejected amendments to UFD Strategic Direction⁶⁵ which sought inclusion of active and public transport when describing provision of high density zones.
- h. Rejected submission seeking St Patrick's Estate Precinct provisions be supported by a qualifying matter of a comprehensive structure plan⁶⁶ (acknowledging Mr Muspratt's proposed additional Objective HZR-PREC2-01 and HRZ-PREC-P2 which generally propose to avoid or remedy transport network effects⁶⁷).
- i. Rejected submission seeking the same change (to include access to active and public transport) to policies NCZ-P1, LCZ- P1, MUZ- P1 and TCZ- P1⁶⁸. Mr Muspratt reflects that the policy structure focuses on activities (appropriate to inappropriate) and that reference to public and activity transport is necessary⁶⁹.

⁶⁰ Section 42A Report, paragraph 626.

⁶¹ S50.13.

⁶² Section 42A Report, paragraphs 513 and 514.

⁶³ S50.6.

⁶⁴ Section 42A Report, paragraph 194.

⁶⁵ S50.9.

⁶⁶ S50.19 and FS10.

⁶⁷ Appendix 1 Recommendations on Submissions and Further Submissions, page 183.

⁶⁸ S50.21

⁶⁹ Section 42A Report, paragraph 902.

- j. Rejected submission proposing to reference access to activity and public transport in CCZ-O2⁷⁰ ; Mr Muspratt considers the focus of this objective is on street frontages, not transport⁷¹.
- k. Amend High Density walkable catchments to be 800m from train stations, TCZ, CCZ (particularly extend it further north boundary Fergusson Drive but recognising barriers such as State Highway 2 / the Hutt River)⁷² and to 200m-400m around LCZ⁷³. Mr Muspratt⁷⁴ has provided detailed assessment of his support for the extent of zoning as notified which I have considered and largely accept his opinion on this matter.

7.4 I address items (g) to (k) in section 12 below.

8 QUALIFYING MATTERS

8.0 For context, the Section 32 Qualifying Matters⁷⁵ (**S32 QM**) confirms that:

This IPI proposes to retain existing qualifying matters that fall under clauses (a), (b), (e) and (f) of section 77I.

8.1 However the only infrastructure item (77I(e)) referenced within the S32 QM is electricity infrastructure⁷⁶. The same report also records that the *timing and resourcing limitations and challenges associated with the mandatory IPI notification date*⁷⁷ precluded inclusion of new QMs.

8.2 KiwiRail has submitted that the rail corridor be a QM and requested provisions on that basis. Waka Kotahi similarly sought the state highway was a QM in relation to noise and St Patricks Estate Precinct.

8.3 Mr Muspratt records that he has some technical and principles based concerns⁷⁸ regarding introduction of a QM to support reverse sensitivity

⁷⁰ S50.22

⁷¹ Section 42A Report, paragraph 605.

⁷² S50.1 and 50.26.

⁷³ S50.2 and 50.27.

⁷⁴ Section 42A Report, paragraphs 556 to 564

⁷⁵ Proposed Intensification Planning Instrument for the Upper Hutt City District Plan Section 32 Evaluation Report Volume 4: Qualifying Matters dated July 2022, Section 3.1..

⁷⁶ Proposed Intensification Planning Instrument for the Upper Hutt City District Plan Section 32 Evaluation Report Volume 4: Qualifying Matters dated July 2022, Section 3.3.

⁷⁷ Proposed Intensification Planning Instrument for the Upper Hutt City District Plan Section 32 Evaluation Report Volume 4: Qualifying Matters dated July 2022, Section 2.0.

⁷⁸ Section 42A Report, commencing at paragraph 1109.

provisions and invites parties to provide further information. I have addressed Mr Muspratt's concerns in Table 1 below.

8.4 In my view, it is appropriate and the correct approach to provide for KiwiRail's proposed 5m setback as a qualifying matter. However, as the legal submissions for KiwiRail and Waka Kotahi will explain, the noise and vibration standards requested by the parties could be provided as a 'related matter' under section 80E(b) of the RMA rather than as a qualifying matter. I defer to those legal submissions in terms of the correct statutory process to use. I remain of the view that the noise effects from the rail and road networks need to be managed both in terms of health and amenity effects on the new residents and related potential reverse sensitivity effects on the operation of those networks in terms of the new dwellings to be constructed within the up-zoned areas.

Table 1: Responses to specific concerns raised by Reporting Planner

Technical and Principles Concern ⁷⁹	Response
<p><i>a. The lack of site-specific information and justification for the requested new qualifying matters including:</i></p> <p><i>i. technical information such as noise evidence, and evidence that demonstrates a legitimate resource management issue exists in the location(s) where the submitters request the application of a new qualifying matter – such as evidence of noise complaints;</i></p> <p><i>ii. technical information to identify the spatial extent that would be necessary to provide for the requested qualifying matters, such as requested 'buffer areas' or specific setbacks from sites or infrastructure;</i></p>	<p>As detailed in paragraphs 8.9 and 8.10, a site specific assessment is required only where Section 77J is relied on to include a qualifying matter. KiwiRail are relying on Section 77I(e) and Section 77O(e) (not 77I(j) and 77O(j)) therefore a site specific assessment is not required.</p> <p>Evidence that an 'effect' is present and occurring is provided by Dr Chile's evidence supported by international research.</p> <p>The spatial extent of the provisions and zones in which they apply are identified in the submissions (5m for building setback, 100m for the permitted activity noise provision and 60m for the permitted activity vibration provision).</p> <p>Waka Kotahi and KiwiRail have advised they can provide separate GIS spatial layers to show the 100m noise and 60m vibration (for KiwiRail) overlays for inclusion within the District Plan maps to assist with legibility of this control.</p>
<p><i>b. The lack of specific information to enable an evaluation of the requested new qualifying matters under sections</i></p>	<p>This is addressed in paragraphs 8.4 to 8.14.</p>

⁷⁹ Section 42A Report, commencing at paragraph 1109, items (a), (b) and (c) within Table 1.

<p><i>77J, 77L, 77P, and 77R of the RMA with respect to the duty to justify all proposed new qualifying matters;</i></p>	
<p><i>c. The inability of all directly affected property owners to consider the requested new qualifying matter areas and participate in the IPI process. I note the requested provisions for new qualifying matters- such as those requested by submitter S43 – KiwiRail, are not accompanied by specific spatial mapping identifying all affected properties.</i></p>	<p>I acknowledge that for a public plan change process of this nature, particularly for lay people, some effort would need to be made to stay informed of submissions. However this is the same process as for all submissions (and the wider plan change process).</p> <p>Properties adjoining the rail corridor and state highway network are readily identifiable, KiwiRail and Waka Kotahi will be providing GIS spatial layers to assist further as I have outlined above.</p>
<p><i>[...] the District Plan already contains provisions that require decision makers to turn their minds to the actual and potential effects on infrastructure, including regionally significant infrastructure. Existing provisions include objective NU-O1 and policy NU-P3, which state: [...]⁸⁰</i></p>	<p>I have addressed this in my Section 9 and conclude that while the Plan does contain an objective and policy framework which responds to the RPS requirements, there is a somewhat of a dislocation between the objective and policy framework and delivery due to a lack of rules or standards to protect infrastructure from reverse sensitivity and/or provide a safe environment for communities adjoining infrastructure corridors.</p> <p>I also conclude that new specific objectives and policies relating to proposed provisions within Residential, and a variety of business zones (for building setbacks) and noise and vibration (Noise chapter) are a better fit than reliance on existing (more general) objectives and policies located in the Network Utilities chapter.</p>

8.5 Council may introduce Qualifying Matters (defined under **Section 77I**) for residential zones to be less enabling than required under the MDRS or Policy 3 of the National Policy Statement for Urban Development. Under 77I(e), the rail network is *a matter required for the purpose of ensuring the safe or efficient operation of nationally significant infrastructure.*

8.6 **Section 77O** essentially follows the structure of 77I in allowing less-enabling provisions but applies to urban non-residential areas. It similarly refers to the

⁸⁰ Section 42A Report, commencing at paragraph 1114.

safe or efficient operation of nationally significant infrastructure (77O(e)) as a qualifying matter (**QM**).

8.7 The NPSUD 2020 defines nationally significant infrastructure:

nationally significant infrastructure means all of the following:

[...]

(e) the New Zealand rail network (including light rail)

[...]

(g) rapid transit services (as defined in this clause) [...]

rapid transit service means any existing or planned frequent, quick, reliable and high-capacity public transport service that operates on a permanent route (road or rail) that is largely separated from other traffic

8.8 I note that:

- a. the rail network is captured under two 'limbs' of the NPSUD definition by both being the *rail network* but also by being a *rapid transit service*; and
- b. the NPSUD does not include a 'hierarchy' between types of rail lines or services (i.e. it is all nationally significant, not just parts).

8.9 Mr Brown has described and I summarise in my paragraph 11.2 below, a 5m setback is recommended to assist with providing a safe network and safety, consequently, contributes to an efficient network therefore responding to matters listed in **Sections 77I(e) and 77O(e)** and as expressly contemplated by the RMA.

8.10 In relation to **Sections 77J** and **77P** (requirement for evaluation reports), Section 77J(3) directs the preparation of an evaluation report which must:

(a) demonstrate why the territorial authority considers—

(i) that the area is subject to a qualifying matter; and

(ii) that the qualifying matter is incompatible with the level of development permitted by the MDRS (as specified in Schedule 3A) or as provided for by policy 3 for that area; and

(b) assess the impact that limiting development capacity, building height, or density (as relevant) will have on the provision of development capacity; and

(c) assess the costs and broader impacts of imposing those limits.

8.11 Section 77P(3) imposes a similar requirement to 77J(3).

- 8.12 The evidence of Mr Brown and I identifies the area subject to the QM and also sets out the reason why the level of development proposed is incompatible with the QM⁸¹ (safety and efficiency). This is intended to assist Council with addressing requirements under Sections 77J and 77P.
- 8.13 Further, I do not agree that Sections 77R and 77L are relevant; both sections require additional 'site-by-site' assessment for matters where 77O(j) and 77I(j) respectively have been relied on as a method to apply a QM (being a 'catch all' clause for any other matter that precludes higher density development). KiwiRail is not relying on 77O(j) or 77I(j) to be a QM.
- 8.14 I also note that other IPIs have recognised the rail corridor as a QM, for example, Selwyn and Waipa⁸².
- 8.15 Finally, notwithstanding my consideration of Mr Muspratt's assessment, Section 80E(b) allows the MDRS process to be amended or to include related provisions that support or are consequential on the MDRS or various NPSUD Policies 3, 4, and 5 of the NPS-UD. As I set out in my paragraph 10.0, it is my opinion that implementation of the MDRS and policies 3 and 4 of the NPS-UD will enable more people to live close to the rail and state highway corridors in Upper Hutt. As a consequence, provisions to mitigate the effects of intensification (such as the noise and vibration controls) are necessary and appropriate to support the implementation of the MDRS and NPS-UD, as well as being consequential to the implementation of greater intensification.

9 RPS FRAMEWORK AND PLAN STRUCTURE

- 9.0 The RPS framework accepts there will be effects from infrastructure (beyond its boundaries) and provides a policy framework in which to manage (balance) these (being Objective 10, Policy 8). The RPS does not require that all effects of infrastructure are internalised. The explanatory text in Chapter 3.3 gives a clear explanation:

The efficient use and development of such infrastructure can be adversely affected by development. For example, land development can encroach on infrastructure or interfere with its efficient use.

⁸¹ Section 77J(a)(ii).

⁸² Waipa District Council RMA Hearings Panel Report, prepared by Damien McGahanS42A Report, dated 17/3/2023, paragraph 9.14.25. https://www.waipadc.govt.nz/repository/libraries/id:26zqz4o7s1cxbyk7hfo7/hierarchy/our-council/waipadistrictplan/documents/Plan%20Change%2026/s42A%20Report/1.%20%20PC26_S42A%20Report.pdf

Infrastructure can also have an adverse effect on the surrounding environment. For example, the operation or use of infrastructure can create noise which may adversely impact surrounding communities. These effects need to be balanced to determine what is appropriate for the individual circumstances⁸³.[bold added]

- 9.1 The RPS also directs (by the use of the term “shall” within Policy 8 and its methods) district councils to include policies and rules that *protect regionally significant infrastructure from incompatible new subdivision, use and development occurring under, over, or adjacent to the infrastructure*. This is a very strong directive; the Upper Hutt City District Plan provides a strong an issue, objective and policy framework within the Network Utilities chapter to support delivery on RPS Policy 8, for example (bold added):

*NU-I2
Managing adverse effects including reverse sensitivity effects on regionally significant network utilities.*

*Inappropriate use and development in the vicinity of regionally significant network utilities may lead to adverse effects including reverse sensitivity effects that have the potential to impact upon the effective and efficient operation of such utilities. Inappropriate use and development may result in adverse effects on regionally significant network utilities and / or restrict access to such network utilities including the ability to undertake maintenance or upgrade work. Reverse sensitivity can occur when sensitive or inappropriate activities locate near to or intensify by existing network utilities and seek to or constrain the operation or expansion of these utilities. This may mean that the local, regional and national benefits of those regionally significant network utilities may be compromised. The City has a lot of well-established regionally significant network utilities located in close proximity to existing land use activities. **The Council is predominantly concerned with new more intensive land use activities establishing in proximity to existing regionally significant network utilities that may lead to reverse sensitivity effects on those utilities.***

*NU-O1
To recognise and protect the benefits of regionally significant network utilities and ensure their functions and operations are not compromised by other activities.*

This objective seeks to identify the importance of regionally significant network utilities within the City and to give effect to the Regional Policy Statement. The objective and supporting policies

⁸³ RPS Introductory text, 3.3 Energy, infrastructure and waste, page 44(b) *Infrastructure*.

are focused on recognising the benefits that these regionally significant network utilities have locally, regionally and nationally and **ensuring that they are protected from incompatible subdivision, use and development.**

NU-P3

Avoid, or as appropriate, remedy or mitigate, the potential for any adverse effects including reverse sensitivity effects on regionally significant network utilities from inappropriate new subdivision, use and development occurring under, over, or adjacent to regionally significant network utilities.

Any potential adverse effects including reverse sensitivity effects, on regionally significant network utilities are to be appropriately managed, with priority given to avoiding adverse effects, where practicable, on those utilities. The location of inappropriate new use or development in proximity to existing regionally significant network utilities has the potential to compromise the efficient operation and use of the network utility including restricting access and result in the benefits of that network utility being reduced. In addition, the safety and amenity values of the community may be adversely affected by locating in too close proximity to regionally significant network utilities. The potential for adverse effects including reverse sensitivity effects may arise when the pattern and density of land use activities changes through the rezoning of land. At the time of rezoning, the Council will seek to introduce new provisions to manage those potential adverse effects on existing or designated regionally significant network utilities. Any applications that involve potential intensification located in proximity to regionally significant network utilities will require assessment in terms of the potential effects on those utilities as well as consultation with the relevant network utility operator.

NU-M1

District Plan provisions consisting of the following:

[...]

5. Plan change(s) to introduce new provisions to manage reverse sensitivity effects on regionally significant network utilities where there are pressures for new or intensification of existing development in proximity to regionally significant infrastructure.

[...]

- 9.2 Mr Muspratt has also identified objective NU-O1 and policy NU-P3 as possibly addressing KiwiRail's concerns combined with other recommended amendments to add 'reverse sensitivity effects' to the matters of discretion within specific zone-based rules⁸⁴.
- 9.3 I agree with Mr Muspratt that the NU-O1 and policy NU-P3 are helpful and support his proposed changes to include *reverse sensitivity* in a range of

⁸⁴ Appendix 1 Recommendations on Submissions and Further Submissions, page 400.

matters of discretion within the Plan. I have not however located any rules which directly address effects of noise, vibration or operational safety (setbacks) on infrastructure within the IPI intensification (noting the RPS directs rezoning is the time to consider this).

- 9.4 I also have reservations regarding the location of NU-O3 and NU-P3 being within the Network Utilities chapter (as compared to being, for example, in the Noise Chapter where noise provisions managing effects would be located).
- 9.5 In my opinion, specific objective and policies are better placed in the same chapter as the rules which implement them. This allows for policy responses to be tailored. For example, a Residential Chapter policy for setbacks could be provided; this approach provides clear directives when assessing consent applications. I note KiwiRail's submission (supported by Waka Kotahi) which suggests, as an alternative, that noise and vibration rules are included in each relevant zone, (i.e. NCZ-P2, LCZ-P2, MUZ-P2 and TCZ-P2). I consider this is a feasible alternative but would result in duplication within the Plan (compared to having objectives located in the Noise Chapter).
- 9.6 If Noise chapter objectives and policies (or, in the alternative zone specific objectives and policies) proposed by KiwiRail are not adopted, a minimum (and significantly less preferred in my opinion) alternative would be a cross reference to NU-O3 and NU-P3 to (proposed) rules and standards; this cross-reference approach is already reflected in the Plan. I prefer this less as NU-O3, and more particularly NU-P3 are helpful but *general* policies whereas the KiwiRail proposed building setback and noise policies are more specific and would be better located in the Noise, or alternatively, zone specific chapters where rules are included.

10 NOISE AND VIBRATION

- 10.0 The implementation of the MDRS and policies 3 and 4 of the NPS-UD will result in more people living near the rail and state highway corridors in Upper Hutt. As a consequence, provisions to mitigate the effects of intensification (such as the setback and noise and vibration controls) are necessary and appropriate to support the implementation of the MDRS and NPS-UD, as well as being consequential to the implementation of greater intensification.

- 10.1 Dr Chiles⁸⁵ has provided evidence which demonstrates effects from noise and vibration; I accept and summarise the key findings as:
- a. Research confirms that noise and vibration have adverse health and amenity effects on people⁸⁶;
 - b. Based on his analysis, Dr Chiles concludes the appropriate provisions to manage noise and vibration effects apply from the edge of the designation boundary and are:
 - i. 100m for noise for state highways⁸⁷ and rail⁸⁸; and
 - ii. 60m for vibration effects to manage health effects . The control (60m) is designed to capture the worst of those likely effects, not all effects. Dr Chiles balances the variability of vibration effects and his preference for 100m control⁸⁹.
- 10.2 Overall, Dr Chiles has provided technical evidence which demonstrates health effects will occur as a result of noise and vibration and therefore it is appropriate to include noise and vibration control provisions.
- 10.3 For the reasons outlined in section 9 above, I support a specific objective and policy (and associated rules/matters of discretion) being included in the Noise chapter (preferred outcome), zone specific chapters (next preferred outcome), or, (significantly less preferred), a direct cross reference to NU-O1 and NU-P3.
- 10.4 Inclusion of a definition for *noise sensitive activity* is also proposed to support the implementation of the proposed noise and vibration provisions. I agree with this as without this definition it is unclear what activities the rules would apply to.
- 10.5 I note that there are a number of proposed provisions (e.g. MUZ-S5, CCZ-S5) which include minimum internal noise for habitable rooms and ventilation. Where these controls apply in addition to the rail and state highway noise

⁸⁵ Statement of Dr Stephen Chiles, 19 April 2023.

⁸⁶ Statement of Dr Stephen Chiles, 14 April 2023, paragraphs 4.1 to 4.6.

⁸⁷ Statement of Dr Stephen Chiles, 14 April 2023, paragraph 6.10 to 6.11.

⁸⁸ Statement of Dr Stephen Chiles, 14 April 2023, paragraph 6.4 to 6.6.

⁸⁹ Statement of Dr Stephen Chiles, 14 April 2023, paragraph 6.7 to 6.9.

provisions, the most restrictive would apply (as is the case where there are overlapping controls).

- 10.6 I have considered other methods (limited noise control and no vibration control) to address health, amenity and reverse sensitivity effects. For KiwiRail, this is assessed in the format of Section 32AA and included as Attachment C and I conclude that a 'permitted activity' setback for noise and vibration is the most efficient outcome to provide for health and amenity along with consequentially reducing potential reverse sensitivity effects.
- 10.7 For Waka Kotahi, I have appended a Section 32 Assessment as Attachment D. Dr Chiles and I were involved in the writing of the Section 32 Assessment, I am familiar with its content and agree with its recommendations. My proposed amendments (including alternatives) are included in Attachment A.
- 10.8 Finally, in terms of the specific wording of rules and matters of assessment, I have modified the wording contained in KiwiRail's submission to reflect both road and rail noise (and vibration for rail) to be included in one Standard (new NOISE-S7) rather than KiwiRail's submission which sought separate rules for noise and vibration.

11 KIWIRAIL BUILDING SETBACKS

- 11.0 KiwiRail's submission sought new objective, policy, rule and matter of discretion to provide for a 5m setback from the boundary adjoining the rail corridor for all zones which adjoin the rail corridor. These are not intended to operate as a "no build zone", but rather provide a nuanced approach to development adjoining the rail corridor.
- 11.1 For the reasons outlined in section 8 above, I support specific objective and policy being included in relevant Chapters for zones i.e. those which have a rail designation boundary and where a building setback is proposed to apply. Alternatively, and less preferred, a direct cross reference to NU-O1 and NU-P3 could be included (both options are reflected in my Attachment A).
- 11.2 I rely on Mr Brown's evidence which⁹⁰:

⁹⁰ Statement of Evidence of Mike Brown dated 19 April 2023 at 5.1 to 5.12.

- a. describes why a 5m metre setback is necessary (relative to a three / 12m storey building); and
 - b. describes the risk to persons both accessing the rail corridor (to undertake adjoining property maintenance) and rail corridor users (train operators and passengers).
- 11.3 In addition to Mr Brown's evidence, it is not uncommon for District Plans to include provisions which limit uses of land to protect the operation of infrastructure and also to provide safe and healthy environments for people.
- 11.4 For example, Transpower has included in a range district plans⁹¹ a national grid corridor overlay which restricts activities within a specified spatial extent of its network. Airports and ports are another common infrastructure type which restricts activities on surrounding private land⁹².
- 11.5 For completeness, I have considered other methods (no setback and extending existing designation widths) to provide for building maintenance and safety of adjoining occupants. This is assessed in the format of Section 32AA and included as Attachment B and I conclude that a setback is the most efficient outcome. I have relied on the evidence of Mr Brown as to the extent of that setback.
- 11.6 These changes are included in my **Attachment A**. My changes reflect only alterations to zone provisions where the particular zone directly adjoins the rail corridor (rail designation boundary), noting that KiwiRail's submission was broader and applied to some zones where there is no shared designation boundary. This includes an objective, policy, rule and matter of discretion.
- 11.7 Finally, in preparing my proposed amendments in relation to KiwiRail's proposed new objective and policy to support setbacks (for the City Centre, Mixed Use Business, High Density Residential, General Residential, Industrial zones), I have considered Transpower's further submission which⁹³, while not opposing the provisions, did put forward alternative wording to ensure the KiwiRail objective and policy were focused on KiwiRail assets (rather than infrastructure more broadly). I propose some adjustments to take into

⁹¹ For example, Chapter D26 of the Auckland Unitary Plan.

⁹² For example, Chapters D24 Aircraft Noise Overlay and D25 City Centre Port Noise Overlay of the Auckland Unitary Plan.

⁹³ On KiwiRail S43.14.

account Transpower's concern. Red text is KiwiRail's submission, blue text is my proposed modification.

OX. Built development is of an appropriate scale and location to minimise risks to public health and safety from the rail corridor.

PX. Require activities adjacent to the rail designation boundary regionally significant network utilities to be setback a safe distance in order to ensure the ongoing safe and efficient operation of the rail corridor those utilities and the communities who live adjacent to them.

12 WAKA KOTAHI

UFD Strategic Direction

- 12.0 Proposed amendments to UFD Strategic Direction to include of active transport and public transport have not been accepted on the basis that other changes have been made⁹⁴. I would prefer to see the Waka Kotahi wording adopted so it may add strategic support to the other changes noted by Mr Muspratt.

Higher density residential development is provided for within walkable catchments of retail, service and public transport centres specifically near the City Centre Zone (central business district), and major transport nodes. Higher density residential development, accessible by active and public transport is provided for in these areas via the High Density Residential Zone.

NCZ-P1, LCZ- P1, MUZ- P1 and TCZ- P1

- 12.1 Mr Muspratt rejected the Waka Kotahi submission seeking the same change (to include access to active and public transport) to policies NCZ-P1, LCZ- P1, MUZ- P1 and TCZ- P1⁹⁵. Mr Muspratt reflects that the policy structure focuses on activities (appropriate to inappropriate) and that reference to public and activity transport is necessary⁹⁶.
- 12.2 I understand his position and accept it in relation to public transport. I do however consider these is some scope of the four identified zones to support

⁹⁴ Section 42A Report, paragraph 181.

⁹⁵ S50.21

⁹⁶ Section 42A Report, paragraph 902.

active transport. In response I propose a modified provision and consider it would fit within both the existing policy framework (for the four identified zones) and contribute to giving effect to NPSUD Policy 1(c). I anticipate the addition of (4) would be implemented by methods such as provision of cycle parks.

NCZ-P1, LCZ- P1, MUZ- P1 and TCZ- P1

Enable appropriate activities that:

- 1. Are compatible with the anticipated purpose and character planned urban built form of the Neighbourhood Centre Zone;*
- 2. Provide for the day-to-day needs of the immediate residential neighbourhood; ~~and~~*
- 3. Minimise adverse effects on adjoining residential, recreational and open space sites; ~~and~~*
- 4. support the provision of active transport.*

CCZ-O2

- 12.3 Mr Muspratt rejected including reference access to activity and public transport in CCZ-O2 as he considered the focus of this objective is on street frontages, not transport⁹⁷. When read as a whole and with reference to the heading; the focus of the objective is, in my opinion, wider than just streetscape (which is only included in the last sentence). Reference is also made to compact built form, high density and it being an attractive place to visit, work or live. I consider it is appropriate that the City Centre is supported by active and public transport and that this is recognised at an objective level. I acknowledge that the Waka Kotahi amendment does not sit comfortably where initially proposed (in the 'streetscape sentence') and in this regard propose the same wording but located in a different position (red underlined).

*CCZ-O2 Character and Qualities of the CCZ – City Centre Zone
The City Centre is characterised by a compact built form that reflects the high-density urban environment with access to active and public transport. Buildings and open spaces are of high quality, well-designed and create an attractive place to visit, work or live. Active and attractive street frontages create a lively environment with a strong pedestrian focus.*

⁹⁷ Section 42A Report, paragraph 605.

St Patrick's Estate Precinct

- 12.4 I have considered Mr Muspratt's response and the evidence of Mr Wignall to the Waka Kotahi request that a QM be applied in the form of structure plan with, among things, suitable transport assessment and mitigation be included within the provisions for the proposed St Patrick's Precinct (**Precinct**).
- 12.5 I have reviewed Mr Muspratt's proposed amendments⁹⁸ to HRZ-PREC2-O1, HRZ-PREC2-P1 and the Precinct's Introductory Text and confirm that I support his changes which seek to allow a range of uses and to avoid, or remedy reverse sensitivity effects and adverse effects on the transportation network. I note that the transport network is, in my opinion greater than just roads but also includes facilities for active and public transport. I agree with Mr Muspratt⁹⁹ that the existing Special Activity Zone (**SAZ**) forms the baseline for considering potential effects of the IPI. However as explained below, I conclude that the likely level of development provided for without resource consent under the SAZ is (unquantified but) very limited based on existing plan provisions.
- 12.6 The overall Precinct development is expected to be urban, however there are very few permitted activities¹⁰⁰ i.e. residential and educational in the St Patrick's Estate Area - College noting that the majority of the site is within the St Patrick's Estate Area – Managed Development; the later having no relevant permitted activities¹⁰¹ in terms of likely transport effects.
- 12.7 A large array of controlled activities are provided for; e.g. commercial development, offices, places of assembly, garden centres, educational facilities (some in College and some in Managed Development areas)¹⁰².
- 12.8 While there are no significant transport assessment or 'trip generation' controls (standards or rules) within the SAZ or the Transport Chapter which offer an opportunity to ensure traffic effects of larger scale development are avoided, remedied or mitigated; there are a range of *SAZ Matters for Consideration* which indicate that access and traffic generation need to be addressed. For example:

⁹⁸ Section 42A Report, paragraphs 1154 (2) to (5).

⁹⁹ Section 42A Report, paragraph 1126.

¹⁰⁰ SAR-R13 and R14.

¹⁰¹ SAR-R10, R11 and R14.

¹⁰² SAR-R17.

SAZ-MC1 Access

1. Accessibility for public transport, cyclists and pedestrians.

[..]

4. Whether the activities proposed will not generate a demand for servicing facilities.

5. Whether suitable alternative provision for servicing can be made.

6. Whether the nature of adjacent roads is such that the entry, exit and manoeuvring of vehicles can be conducted safely.

SAZ-MC2 Traffic generation

1. Whether activities which generate significant traffic flows have satisfactory access arrangements.

2. Impacts on public safety.

12.9 In addition, SAZ-MC3 (1) refers to site layout and vehicle movements, SAZ-MC8 addresses cumulative effects. Conditions which Council may impose include (for example) SAZ-R17 Commercial Development:

2. Design and layout of car parks, loading, manoeuvring, pedestrian links and access.

3. Provision of and effects on utilities and/or services.

8. The outcome of consultation with the owner or operator of regionally significant network utilities (excluding the National Grid) located on or in proximity to the site. Note: Rule SUB-SAZ-R7 covers subdivision within the Electricity Transmission Corridor

12.10 The relevance of these matters is that they confirm the level of *permitted* land use (i.e. without consent) is very limited and while a controlled activity consent must be granted, the SAZ-MC and items require assessment and management of any transport effects arising via conditions.

12.11 Mr Muspratt has confirmed he is aware of potential transport safety effects¹⁰³ of development of the precinct and refers to his assessment of the Silverstream Land Holdings Ltd (**SLHL**) submission (which seeks a Mixed Use zone for the Precinct) and the evidence of Mr Wignall.

12.12 Mr Wignall, in assessing the SLHL relief has identified¹⁰⁴ that intensification of some activities should be assessed with an ITA:

In view of the fact that the St Patrick's Urban Precinct is an area of intensification, proximity to Fergusson Drive and Silverstream Rail Station, an ITA should be undertaken if activities either:

¹⁰³ Section 42A Report, paragraph 1127.

¹⁰⁴ Evidence of Donald Wignall, 6 April 2023, paragraph 16.

- a) Require a new access onto a public road, or*
- b) Are expected to generate 100 vehicles per hour (VPH) or more, as expressed in terms of passenger car units (PCU).*

12.13 The SLHL assessment¹⁰⁵ is informative and confirms Mr Wignall's opinion that further ITA assessments are needed, but it does not address the key focus of the Waka Kotahi submission which is ensuring plan provisions are available to address the potential transport effects (including active and public transport modes) of the notified zone.

12.14 In my experience, the assessment steps commonly followed to determine whether a specific planning response is required to manage transport impacts include:

- a. An assessment of permitted development (and consequential transport effects) – this would be based on the existing SAZ;
- b. An assessment of permitted development (and consequential transport effects) – this would be based on the proposed zoning;
- c. Determination as to whether there are different effects between existing and proposed zoning and if there are, what mitigation may be provided (e.g. road corridor or active/ public transport changes); and
- d. Assuming there is (or may be) an effect, a planning response to that. Commonly this process results in plan provisions which specify further detailed assessment at later stages or, if there is a high level of assessment already completed, provisions which tie levels of development and specific mitigation (e.g. more than 100 dwellings requires XX intersection upgrade and provision of shared path connecting to public transport or community facilities).

12.15 Based on my experience and assessment above, I would anticipate an (unquantifiable) increase and/or change in effects between the existing and proposed zones in relation to transport. Currently there is no mechanism proposed to either quantify or, as necessary, manage those effects on the transport network. On this basis, I recommend plan provisions which include

¹⁰⁵ Section 42A Report, paragraph 1128 to 1141.

specifying further detailed assessment at later stages. I have included recommendations in Attachment A.

13 CONCLUSION

13.0 In conclusion:

- a. **Noise and Vibration:** Dr Chiles has provided evidence that noise and vibration have adverse health effects. A suite of provisions, including permitted activities and associated standards are considered appropriate to implement RPS Policy 8. The legal submissions for the parties will address the legislative framework for the inclusion of these provisions.
- b. **Building Setback:** A 5m building setback from the rail corridor is considered to be a Qualifying Matter as it is required to enable the nationally significant infrastructure to operate in a safe and efficient manner. Based on Mr Brown's evidence, a 5m setback is suitable to ensure safe building maintenance within property boundaries. A suite of provisions across zones which adjoin the rail designation boundary are proposed and appropriate.
- c. **Specific Provisions:** I recommend amendments to NCZ-P1, LCZ- P1, MUZ- P1 and TCZ- P1, CCZ-O2 to reflect active and public transport modes.
- d. **St Patrick's Estate Precinct:** amendments are proposed to ensure effects on the transport network are managed by application of appropriate provisions. Changes to objectives and policies proposed by Mr Muspratt to recognise and manage effects on the transport network are supported.
- e. Combined, the changes proposed will recognise effects of infrastructure (as recognised in the RPS) and also provide opportunities for intensification / sensitive activities (as required by the NPS-UD) where appropriate mitigation is provided.

Cath Heppelthwaite
19 April 2023

Attachment A: Proposed Changes

Base text is taken from Appendix A – Planners recommendation with changes accepted. All changes are in red text. New text is underlined and proposed deletions in ~~strike through~~. Relief headings include whether the amendment sought is for KiwiRail, Waka Kotahi or both.

Definitions (KiwiRail)

Activities sensitive to noise

Activities sensitive to noise means any residential unit, minor residential unit, family flat, rest home, retirement village, marae, community care housing, early childhood centre, educational facility, kōhanga reo, hospital, and healthcare facilities with an overnight stay facility.

Qualifying matter area

Qualifying matter area means a qualifying matter listed below:

[...]

(s) areas adjacent to the railway corridor.

New objective for the following zones: City Centre, Mixed Use Business, High Density Residential, General Residential, Industrial (KiwiRail)

OX. Built development is of an appropriate scale and location to minimise risks to public health and safety from the rail corridor.

Alternative relief:

Include by cross reference, direct consideration of NU-O1 within each of the identified zones.

New policy for the following zones: City Centre, Mixed Use Business, High Density Residential, General Residential, Industrial (KiwiRail)

PX. Require activities adjacent to the rail designation boundary to be setback a safe distance in order to ensure the ongoing safe and efficient operation of the rail corridor and the communities who live adjacent to them.

Alternative relief:

Include by cross reference, direct consideration of NU-P3 within each of the identified zones.

UFD Strategic Direction (Waka Kotahi)

[...]

Higher density residential development is provided for within walkable catchments of retail, service and public transport centres specifically near the City Centre Zone (central business district), and major transport nodes. Higher density residential development, accessible by active and public transport is provided for in these areas via the High Density Residential Zone.

NCZ-P1, LCZ- P1, MUZ- P1 and TCZ- P1 (Waka Kotahi)

Enable appropriate activities that:

- 1. Are compatible with the anticipated purpose and character planned urban built form of the Neighbourhood Centre Zone;*
- 2. Provide for the day-to-day needs of the immediate residential neighbourhood; ~~and~~*
- 3. Minimise adverse effects on adjoining residential, recreational and open space sites; ~~and~~*
- 4. support the provision of active transport.*

CCZ-O2 Character and Qualities of the CCZ – City Centre Zone (Waka Kotahi)

The City Centre is characterised by a compact built form that reflects the high-density urban environment with access to active and public transport. Buildings and open spaces are of high quality, well-designed and create an attractive place to visit, work or live. Active and attractive street frontages create a lively environment with a strong pedestrian focus

GRZ-S4 (KiwiRail)

GRZ-S4	[...]
<i>Policies</i>	1. Buildings must be set back from the relevant boundary by the minimum depth listed in the yards table below:

GRZ-P2, GRZ-PREC1-P2, GRZ-P4, <u>PX or NU-P3</u>	Yard	Minimum depth
	Front	1.5 metre
	Side	1 metre
	Rear	1 metre (excluded on corner sites)
	<u>Rail designation boundary</u>	<u>5 metres</u>
	[...]	

GRZ-R11 (KiwiRail)

Council will restrict its discretion to, and may impose conditions on:

[...]

(14) The location and design of the building as it relates to the ability to safely use, access and maintain buildings without requiring access on, above or over the rail corridor.

GRZ-R12 (KiwiRail)

[...]

Council will restrict its discretion to, and may impose conditions on:

[...]

(8) The location and design of the building as it relates to the ability to safely use, access and maintain buildings without requiring access on, above or over the rail corridor.

GRZ-R12A (KiwiRail)

[...]

Council will restrict its discretion to, and may impose conditions on:

[...]

(8) The location and design of the building as it relates to the ability to safely use, access and maintain buildings without requiring access on, above or over the rail corridor.

MUZ-S3 (KiwiRail)

1. Buildings must be set back from the relevant boundary by the minimum depth listed in the yards table below:

Yard	Minimum depth
Side	1 metre
Rear	1 metre
<u>Rail designation boundary</u>	<u>5 metres</u>

[...]

Matters of discretion are restricted to:

(5) The location and design of the building as it relates to the ability to safely use, access and maintain buildings without requiring access on, above or over the rail corridor.

CCZ-S2 (KiwiRail)

CCZ-S2 <i>Policies</i> CCZ-P3, CCZ-P4 <u>PX or NU-P3</u>	[...]	
	1. Buildings must be set back from the relevant boundary by the minimum depth listed in the yards table below:	
	Yard	Minimum depth
	Side	1 metre
	Rear	1 metre
	<u>Rail designation boundary</u>	<u>5 metres</u>
	[...]	

GIZ-S2 (KiwiRail)

<p>GIZ-S2</p> <p><i>Policies</i> CCZ-P3, CCZ-P4 <u>PX or NU-P3</u></p>	<p>Setbacks from boundaries</p> <p>(1) The setback distance for buildings from boundaries shall be not less than:</p> <p>(a) Front boundary 8m</p> <p>(b) Side and rear boundaries except where adjoining a General Residential, High Density Residential, or Open Space Zone 0m</p> <p>(c) Side and rear boundaries adjoining a General Residential, High Density Residential, or Open Space Zone 5.5m</p> <p><u>(d) Any boundaries adjoining a rail designation 5m</u></p> <p>[...]</p>
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GIZ-R12 (consequential, provision not listed in S42A Report) (KiwiRail)

Council will restrict its discretion to, and may impose conditions on:

[...]

(10) The location and design of the building as it relates to the ability to safely use, access and maintain buildings without requiring access on, above or over the rail corridor.

St Patrick's Estate Precinct (Waka Kotahi)

New Permitted and Controlled Activity Standard

<u>HRZ-PREC-S1</u>	<u>Standards for Permitted and Controlled Activities</u>	<u>Matters of Discretion where Permitted Activity and Controlled Standard(s) are not met</u>
	<p><u>Any activity which:</u></p> <p><u>a) proposes a new access onto a public road, or</u></p> <p><u>b) will generate 100 vehicles per hour (VPH) or more</u></p>	<p><u>Matters of discretion are restricted to:</u></p> <ol style="list-style-type: none"> <u>1. Accessibility for public transport and active modes.</u> <u>2. Any works or improvements necessary to mitigate effects on the transport network, including active and/or public transport.</u> <u>3. Whether activities which generate significant traffic flows have satisfactory access arrangements and sufficient network capacity.</u> <u>4. Impacts on public safety.</u>

Noise Chapter (KiwiRail and Waka Kotahi)

NOISE-O2

Avoid where practicable, or otherwise remedy or mitigate, adverse effects of subdivision, use and development on regionally significant network utilities.

NOISE-P4

Require activities to be appropriately located and/or designed to avoid where practicable or otherwise remedy or mitigate reverse sensitivity effects on regionally significant network utilities.

Permitted Activities		Zones	
NOISE-R1	[...]		
<u>NOISE-R4</u>	<u>Any new buildings or alterations to existing buildings containing an activity sensitive to noise which</u>	<u>PER</u>	<u>All</u>

	<u>complies with the noise and vibration standards in NOISE-S7</u>		
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<p><u>NOISE-S7</u></p> <p><u>Policies NOISE-P4 NU-P3</u></p>	<p><u>Transport Network Noise and Vibration</u></p> <p><u>Any new building or alteration to an existing building that contains an activity sensitive to noise within 100m of the rail or state highway designation boundary shall be designed to meet the following.</u></p> <p><u>Outdoor road noise</u></p> <p><u>1. Any new building, or alteration to an existing building, that contains an activity sensitive to noise where:</u></p> <p><u>a. external road noise levels are less than 57 dB LAeq(24h) at all points 1.5 metres above ground level within the proposed notional boundary; or</u></p> <p><u>b. there is a noise barrier at least 3 metres high which blocks the line of-sight to the road surface from all points 1.5 metres above ground level within the proposed notional boundary.</u></p> <p><u>Indoor road and railway noise</u></p> <p><u>2. Any new building, or alteration to an existing building, that contains an activity sensitive to noise where the building or alteration is:</u></p> <p><u>a. designed, constructed and maintained to achieve indoor design noise levels resulting from the road or railway not exceeding the maximum values in in Table-S7; or</u></p> <p><u>b. at least 50 metres from the carriageway of any state highway or 50 metres from any railway corridor, and is designed so that a noise barrier entirely blocks line-of-sight from all parts of doors and windows, to the road surface and to all points 3.8 metres above railway tracks.</u></p> <p><u>Table-S7</u></p> <table border="1"> <thead> <tr> <th><u>Building type</u></th> <th><u>Occupancy / activity</u></th> <th><u>Maximum road noise level LAeq(24h)</u></th> <th><u>Maximum railway noise level LAeq(1h)</u></th> </tr> </thead> <tbody> <tr> <td rowspan="2"><u>Residential</u></td> <td><u>Sleeping spaces</u></td> <td><u>40dB</u></td> <td><u>35 dB</u></td> </tr> <tr> <td><u>All other habitable rooms</u></td> <td><u>40dB</u></td> <td><u>40 dB</u></td> </tr> <tr> <td rowspan="2"><u>Education</u></td> <td><u>Lecture rooms / theatres, music studios, assembly halls</u></td> <td><u>35 dB</u></td> <td><u>35 dB</u></td> </tr> <tr> <td><u>Teaching areas, conference rooms, drama studios, sleeping areas</u></td> <td><u>40 dB</u></td> <td><u>40 dB</u></td> </tr> <tr> <td></td> <td><u>Library</u></td> <td><u>45 dB</u></td> <td><u>45 dB</u></td> </tr> <tr> <td><u>Health Clinics</u></td> <td><u>Overnight medical care, wards</u></td> <td><u>40 dB</u></td> <td><u>40 dB</u></td> </tr> </tbody> </table>	<u>Building type</u>	<u>Occupancy / activity</u>	<u>Maximum road noise level LAeq(24h)</u>	<u>Maximum railway noise level LAeq(1h)</u>	<u>Residential</u>	<u>Sleeping spaces</u>	<u>40dB</u>	<u>35 dB</u>	<u>All other habitable rooms</u>	<u>40dB</u>	<u>40 dB</u>	<u>Education</u>	<u>Lecture rooms / theatres, music studios, assembly halls</u>	<u>35 dB</u>	<u>35 dB</u>	<u>Teaching areas, conference rooms, drama studios, sleeping areas</u>	<u>40 dB</u>	<u>40 dB</u>		<u>Library</u>	<u>45 dB</u>	<u>45 dB</u>	<u>Health Clinics</u>	<u>Overnight medical care, wards</u>	<u>40 dB</u>	<u>40 dB</u>
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	<u>Consulting rooms, theatres, nurses' stations</u>	<u>45 dB</u>	<u>45 dB</u>
<u>Cultural</u>	<u>Places of worship, marae</u>	<u>35 dB</u>	<u>35 dB</u>

Mechanical ventilation

3. If windows must be closed to achieve the design noise levels in clause 2(a), the building is designed, constructed and maintained with a mechanical ventilation system that:

a. For habitable rooms for a residential activity, achieves the following requirements:

- i. provides mechanical ventilation to satisfy clause G4 of the New Zealand Building Code; and
- ii. is adjustable by the occupant to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour; and
- iii. provides relief for equivalent volumes of spill air;
- iv. provides cooling and heating that is controllable by the occupant and can maintain the inside temperature between 18°C and 25°C; and
- v. does not generate more than 35 dB LAeq(30s) when measured 1 metre away from any grille or diffuser.

b. For other spaces, is as determined by a suitably qualified and experienced person.

Indoor road and railway vibration

Indoor railway vibration

4. Any new buildings or alterations to existing buildings containing an activity sensitive to noise, closer than 60 metres from the boundary of a railway corridor, is designed, constructed and maintained to achieve road and rail vibration levels not exceeding 0.3 mm/s vw,95.

Design report

5. A report is submitted to the council demonstrating compliance with clauses (1) to (4) above (as relevant) prior to the construction or alteration of any building containing an activity sensitive to noise. In the design:

a. railway noise is assumed to be 70 LAeq(1h) at a distance of 12 metres from the track, and must be deemed to reduce at a rate of 3dB per doubling of distance up to 40 metres and 6 dB per doubling of distance beyond 40 metres; and

b. road noise is based on measured or predicted noise levels plus 3 dB.

Advice Notes

[...]

<u>Restricted Discretionary Activities</u>			<u>Zones</u>
<u>NOISE-R5</u>	<u>Any activity that does not comply with NOISE-S7</u>	<u>RDIS</u>	<u>All</u>

[...]

Matters for Consideration

Matters that may be relevant in the consideration of any resource consent may include the following:

NOISE-MC1	[...]
NOISE-MC2	[...]
<u>NOISE-MC3 for S7</u>	<p><u>1. Whether the activity sensitive to noise could be located further from the state highway or railway network.</u></p> <p><u>2. The extent to which the noise and vibration criteria are achieved and the effects of any non-compliance.</u></p> <p><u>3. The character of, and degree of, amenity provided by the existing environment and proposed activity.</u></p> <p><u>4. The reverse sensitivity effects on the state highway or rail network, and the extent to which mitigation measures can enable their ongoing operation, maintenance and upgrade.</u></p> <p><u>5. Special topographical, building features or ground conditions which will mitigate vibration impacts.</u></p> <p><u>6. The outcome of any consultation with Waka Kotahi NZ Transport Agency or KiwiRail.</u></p>

Attachment B: KiwiRail S32AA Assessment of Building Setback

Having regard to section 32AA, the following is noted:

Effectiveness and efficiency

- The proposed changes will be more efficient and effective than other methods (such as designating a wider corridor to provide setback) as it provides flexibility of use by resource consent allowing for situations where building within the setback is acceptable. Applying a wider designation means land will not be available for use, the setback could affect future use by way of resource consent. This fits RPS Objective 10 and Policy 8 in providing development which can be, with mitigation, compatible within reasonably close proximity to infrastructure.
- Providing no setback will not support an efficient outcome generally as incursions can lead to disruption to the rail network/ inefficient operation and endanger safety.
- The provisions apply to new and altered structures (not retrospectively).
- The provisions provide clear and specific matters of discretion which gives greater certainty to developers (and the Council) over the matters that will be assessed where resource consent is required.

Costs/Benefits

- The recommended amendments will limit building in some locations (cost).
- The benefits are providing for a safer and more efficient rail network which supports passenger transport (being itself a significant supporting factor for residential intensification).
- The changes will enable greater certainty for home owners and occupiers to undertake maintenance to their dwellings.

Risk of acting or not acting

- Evidence has been provided of the risks to public safety and network efficiency if no action is taken. Not acting could result in an inefficient operation of nationally significant infrastructure due to unexpected shutdowns.

Decision about most appropriate option

- The recommended amendments as set out in my evidence are therefore considered to be more appropriate in achieving the purpose of the RMA rather than the notified provisions.

Attachment C: KiwiRail S32AA Assessment of Noise and Vibration Controls

Having regard to section 32AA, the following is noted:

Effectiveness and efficiency

- The proposed changes will be more efficient and effective at balancing infrastructure and health and amenity resulting from intensification than other methods (such as existing 40m controls (noise) or no controls (vibration)). This fits RPS Objective 10 and Policy 8 as it provides development which can be, with mitigation, compatible where close to infrastructure.
- Retaining the 40m noise setback and providing no vibration control will not support an efficient outcome as effects on health and amenity will not be addressed and new reverse sensitivity could arise (which could lead to inefficient operation of nationally significant infrastructure).
- The provisions apply to new and altered structures (not retrospectively).
- The provisions provide clear and specific matters of discretion which gives greater certainty to developers (and the Council) over the matters that will be assessed where resource consent is required.

Costs/Benefits

- The recommended amendments require additional assessments for some buildings and activities in some locations; the benefits are however improved health and amenity and reduced risk of reverse sensitivity effects. The rail network provides passenger transport which is a significant supporting factor for residential intensification proposed.
- There will be some compliance costs for the Council for monitoring and assessing applications for consent (if sought).
- The changes will enable greater certainty for home owners as to their ability to live comfortably and free from the most significant health and amenity impacts when in close proximity to infrastructure.

Risk of acting or not acting

- Health and amenity effects will occur if no action is taken.

Decision about most appropriate option

- Based on the evidence of Dr Chiles, the recommended amendments as set out in my evidence are therefore considered to be more appropriate in achieving the purpose of the RMA (specifically health) rather than the notified provisions.

Attachment D

Assessment of Plan Provisions to Provide for Human Health and Amenity in accordance with section 32 of the Resource Management Act

October 2021

VERSION 8



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Executive Summary

Waka Kotahi seeks a gradual reduction in health and amenity effects implemented as new activities are established or existing activities are altered in close proximity to the operational state highway network. This outcome aligns with *Toitū Te Taiao – Our Sustainability Action Plan*¹ which in turn implements the Government Policy Statement on Land Transport 2018/2019-2027/2028² and the enduring Transport Outcomes: *A framework for shaping our transport system: Enabling New Zealanders to flourish Transport outcomes and mode neutrality*, Ministry of Transport, June 2018.

Achieving these outcomes this will assist regulatory authorities achieving Part 2 of the RMA by providing for the use of natural and physical resources in a way which enables people and communities to provide for their health and safety³ and the maintenance and enhancement of amenity⁴.

There are various regulatory methods (within and outside of the RMA) to achieve this outcome. A district plan based method has been assessed as the most implementable method in the current environment. This assessment considers a range of district plan methods as required under section 32 of the RMA.

The assessment concludes that an integrated suite of district plan provisions is the most effective and efficient method to provide reasonable levels of amenity and health protection for sensitive activities. The recommended provisions are based on a (modelled) noise contour line being established with activities 'inside' the contour being subject to specific requirements to provide improved health and amenity outcomes.

The recommended provisions relate to new or altered (increased) sensitive activities located within the modelled noise contour and the usual operation of the transport network, they do not:

- a. apply retrospectively to existing buildings or sensitive activities;
- b. require land owner to address effects resulting from transport network defects (eg potholes), which are the responsibility of the road controlling authority; or
- c. manage amenity effects from transport noise from new or altered roads where these fall within the ambit of NZS 6806:2010 (Acoustics – Road traffic noise – New and altered roads).

¹ <https://www.nzta.govt.nz/assets/About-us/docs/sustainability-action-plan-april-2020.pdf>

² See paragraphs 123-124 and Table 1 Action 25 – Environment.

³ Section 5(2), RMA.

⁴ Section 7(c), RMA.

1. Introduction

The report has been prepared by Waka Kotahi NZ Transport Agency in accordance with Section 32 of the Resource Management Act 1991 (RMA) to assess the inclusion of human health and amenity provisions within District Plans.

Managing health effects from road noise is a shared responsibility between the road controlling authority and adjacent land users. Territorial authorities also have an important role to play in ensuring that planning instruments appropriately acknowledge and address the issue. Waka Kotahi invests significantly in design, construction and ongoing maintenance to minimise the effects of road noise. It is appropriate that those establishing or modifying land uses adjacent to existing State highways also share responsibility for protecting the health of occupants.

Retrospective management of transport noise effects is generally more difficult and expensive to achieve once activities have established adjacent to transport corridors. Management options are also more limited once activities are in place. For example, some design responses (eg. locating outdoor living areas away from noise sources) are not easily implemented or are precluded, retrospective building improvements can be challenging to implement, costly and disruptive, and property constraints may also limit response options (eg. no land available for acoustic barriers or bunding).

This report evaluates opportunities to provide plan provisions in accordance with section 32 of the RMA (s32). Under the RMA, a section 32 evaluation must:

- a. Examine whether the proposed objectives are the most appropriate way to achieve the purpose of the RMA (s32(1)(a));
- b. Examine whether the proposed provisions are the most appropriate way to achieve the objectives by identifying other reasonably practicable options, assessing their efficiency and effectiveness and summarising the reasons for deciding on provisions (s32(1)(b));
- c. Relative to considering the efficiency and effectiveness of the provisions in achieving the objective, include an assessment of the benefits and costs of the effects anticipated from implementing the provisions (s32(2)); and
- d. Contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from implementing the proposal (s32(1)(c)).
- e. For plan changes, evaluate the proposal against both the objectives of the proposed plan change and the objectives of the existing plan (s32(3)).

Each of these matters is addressed by examining the key issues pertaining to the human health and amenity, and how a range of responses could operate in order to achieve the desired outcomes. This report is supplemented by an 'issue identification' statement (Section 2) which describes the human health effects at issue and assesses the cost of implementing mitigation.

In addition to RMA Part 2 outcomes (including of providing for communities health⁵), Waka Kotahi seeks a gradual reduction in exposure as existing activities are altered or relocated. This outcome aligns with *Toitū Te Taiao – Our Sustainability Action Plan*⁶ which in turn implements the Government Policy Statement on Land Transport 2018/2019-2027/2028⁷ and the enduring Transport Outcomes: *A framework for shaping our transport system: Enabling New Zealanders to flourish* Transport outcomes and mode neutrality, Ministry of Transport, June 2018.

⁵ Resource Management Act, Part 2, Section 5(1).

⁶ <https://www.nzta.govt.nz/assets/About-us/docs/sustainability-action-plan-april-2020.pdf>

⁷ See paragraphs 123-124 and Table 1 Action 25 – Environment.

2. Issue identification

It is widely accepted nationally and internationally that noise from transport networks have the potential to cause adverse health and amenity effects on people living nearby. That potential has been documented by authoritative bodies such as the World Health Organisation (WHO)⁸ including the publication *Environmental noise guidelines for the European region* in October 2018 (WHO Europe Guidelines).⁹ The WHO Europe Guidelines are based on a critical review of academic literature and followed a rigorous protocol to assess the evidence of adverse effects.

With respect to sound from transport networks, the WHO Europe Guidelines note the potential for the following adverse effects:

- i. sleep disturbance;
- ii. high annoyance;
- iii. hypertension; and
- iv. ischaemic heart disease.

Based on the strength of the evidence of adverse effects, WHO recommends that policymakers reduce sound exposure from transport networks to below a range of guideline values.

State highways¹⁰ pass through both urban and rural areas and most have sufficient traffic volumes to generate sound above WHO Europe Guideline levels, indicating there will be impacts on human health and amenity where noise-sensitive activities locate nearby.

In New Zealand, Quality Planning's *Managing Land Transport Noise Under the RMA 2013* Guidance Note¹¹ recognises that transport noise has potential health effects and identifies district plan responses (eg. managing sensitive activity location, setbacks, zoning (and re-zoning), and structural restrictions). The Guidance Note provides:

One of the environmental results expected with the management of noise in plans should be the protection of people and communities from the impacts of land transport noise exposure¹².

Within the Guidance Note, five alternative (non-RMA) responses¹³ are identified (urban design strategy, bylaws, NZ Standards, Building Code and Waka Kotahi guidance). Two of these (the Building Code and Waka Kotahi guidance) are addressed in this assessment.

It is acknowledged that the notified [plan review/plan change] includes provisions which address amenity; however, for the reasons set out below, these are not considered to fully address [the issue].

⁸ World Health Organisation, Guidelines for community noise, 1999; World Health Organisation, Night noise guidelines for Europe, 2009; World Health Organisation, Burden of disease from environmental noise, 2011

⁹ World Health Organisation, Environmental noise guidelines for the European region, 2018.

¹⁰ May also apply to high traffic volume roads managed by other Road Controlling Authorities.

¹¹ <https://www.qualityplanning.org.nz/node/825>

¹² <https://www.qualityplanning.org.nz/node/825> 4. Environmental Effects Expected – Optional, page 12.

¹³ <https://www.qualityplanning.org.nz/node/825> Local Approaches – other mechanisms, page 14.

3. Objectives Assessment

Section 32(1)(a) of the RMA requires an examination of whether a proposed objective is the most appropriate way to achieve the purpose of the RMA. The purpose of the RMA is set out in Part 2, Section 5 of the Act.

5 Purpose

(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.

(2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—

- (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
- (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

Waka Kotahi has formulated proposed objectives and policies for inclusion in district plans. An assessment of the proposed objective against RMA section 5 is set out in Table 1, below.

Table 1: Assessment of Objective under Section 5	
Proposed Provision	Reason
<p>Objective 1 Protect sensitive activities from potential health and amenity effects that may arise from operational state highway noise.</p> <p>Policy 1 Locate and design new and altered buildings containing noise sensitive activities to minimise the potential for adverse effects from the designated state highway network.</p> <p>Policy 2 Manage subdivision which could contain noise sensitive activities through setbacks, physical barriers and design controls to ensure subsequent development can be located, designed and constructed to minimise exposure to noise.</p>	<p>Section 2 of this report describes likely adverse effects on sensitive activities where they are located in close proximity to the transport network.</p> <p>The objective (and supporting policies) will enable communities to provide for their social well-being and health by ensuring that noise sensitive activities located in close proximity to a state highway incorporate appropriate protection so as to ensure improved health outcomes and amenity levels.</p>

The balance of Part 2 of the RMA provides the framework for the sustainable management of natural and physical resources. Section 6 lists matters of national importance that shall be recognised and provided for, section 7 lists other matters that all persons exercising functions and powers under the RMA shall have particular regard to and section 8 addresses matters relating to the principles of the Treaty of Waitangi. No relevant matters in sections 6 or 8 have been identified. The proposed objective has been assessed against the following provisions of section 7 in Table 2.

Table 2: Assessment of Objective under Part 2 Section 7	
RMA Provision	Objective 1
s7(b) (the efficient use and development of natural and physical resources)	Objective 1 will provide for the efficient use and development of physical resources (land and the State highway network) by enabling the proximity effects of land use and infrastructure to be managed appropriately.
s7(c) (maintain and enhance amenity values)	Objective 1 will give effect to s7(c) by enhancing amenity by reducing effects of noise on noise-sensitive activities.

It is considered that the proposed objective is consistent with Part 2, section 5 of the Act and will result in the sustainable management of natural and physical resources.

The notified [plan review/plan change] is considered to be a less appropriate or effective way to achieve the purpose of the RMA because ...

4. Provisions Assessment

Sections 32(1)(b) and 32(2) require assessment of the proposed plan provisions to be undertaken. These are summarised as:

- a. whether the proposed provisions are the most appropriate way to achieve the objectives by identifying other reasonably practicable options, assessing their *efficiency and effectiveness* and summarising the reasons for deciding on provisions; and
- b. relative to considering the **efficiency and effectiveness** of the provisions in achieving the objective, include an assessment of the benefits and costs of the effects anticipated from implementing the provisions.

The cost and benefit assessment must identify and assess the costs and benefits associated with environmental, economic, social, and cultural effects including economic growth and employment that are anticipated to be provided or reduced. If practicable, these are to be quantified.

The notified [plan review/plan change] have been included in this assessment.

Section 32(2)(b) also requires an assessment of the risk of acting or not acting if there is uncertain or insufficient information. In this case, there is considered to be sufficient information about the subject to determine the range and nature of effects of the options set out, and so that assessment has not been undertaken.

4.1 Noise

4.1.1 Identifying options

Where the reasonably practical alternative options (assessed in Table 3) include plan provisions, they are framed in the following context:

- a. The provisions apply to all new and altered (by increase in floor area) *Noise Sensitive Activities* (defined in **Attachment 1**) which, in addition to residential activities, includes activities such as student or retirement accommodation, educational activity (including in any child care facility), healthcare activity and any congregations within places of worship/marae.
- b. Internal noise criteria of between 35 dB $L_{Aeq(24h/1h)}$ and 45 dB $L_{Aeq(24h/1h)}$ have been allocated to the *Noise Sensitive Activities* for the reasons described in **Attachment 2**. Specifications detailing how to achieve internal noise space can be either specified as a *Construction Schedule* included as part of **Attachment 1** or by a design certified by an acoustic consultant.
- c. Provisions include ventilation requirements where internal noise criteria are to be met; without ventilation the effectiveness of built acoustic treatment is compromised (ie. windows open for ventilation compromise the performance of building envelope noise mitigation measures). Ventilation requirements are specified in **Attachment 1**.
- d. Outdoor living space provisions apply only to areas specifically identified by the district plan as required outdoor living areas.
- e. Provisions include a mapped extent to which the provision would apply. This is described as Noise Control Boundary Overlay (NCBO) in accordance with the National Planning Standards Mapping Standard or identified as a 'yard'.

- f. The provisions:
- (i) do not apply retrospectively to existing sensitive activities;
 - (ii) are not proposed to require a land owner to address effects resulting from transport network defects (eg potholes), which are the responsibility of the road controlling authority; and
 - (iii) do not manage amenity effects from transport noise from a new or altered road; these generally fall within the ambit of NZS 6806:2010 (Acoustics – Road traffic noise – New and altered roads).

The reasonably practical alternative options identified include (a) to (d) above and are identified as:

- a. **Do nothing:** No plan provisions to protect sensitive activities from potential health and amenity effects.
- b. **Modelled setback:** Require specific response to manage noise based on a (modelled) noise contour line (NCBO) being established. Activities ‘inside’ the NCBO are a permitted activity (for the purposes of noise) if specific requirements are met. For the reasons set out in **Attachment 2**, the recommended extent of the NCBO is set at 57 dB $L_{Aeq(24h)}$. **Attachment 4** explains the basis of the acoustic model which takes into account environmental factors such as traffic volume, road surface, topography and buildings.
- c. **Metric setback:** Require specific response to manage noise where a sensitive activity is located within a specific NCBO based on distance (eg 40m, 80m or 100m) from a state highway. The specific setback distance may be based on speed limit (eg 40m for <70k/hr or 80m or 100m >70k/hr). Activities ‘inside’ the NCBO are a permitted activity if specific requirements are met.
- d. **Yard:** A ‘no build’ setback from state highways. All noise sensitive activities in the yard area are listed non-complying activities. Yard setback could be set based on road speed limit (eg 40m for <70k/hr or 80m or 100m >70k/hr).
- e. **Notified Plan Provisions:** summarise these.

An assessment of the *efficiency and effectiveness* of the options assessed in terms of Sections 32(1)(b) and 32(2) is included in Table 3.

Table 3: Alternative Option Assessment			
Option	Effectiveness and Efficiency	Costs	Benefits
Option A: Do Nothing	Highly efficient but not effective. This option requires no action from the regulatory authority or applicants so is efficient.	An increase in adverse health and amenity impacts (including costs). Poorer health and amenity outcomes fall on wider community and can be difficult to identify or	No additional regulatory cost or costs to land owners in terms of compliance or building cost increases.

Table 3: Alternative Option Assessment			
Option	Effectiveness and Efficiency	Costs	Benefits
	It is considered to be the least effective as it will allow an increase in adverse human health and amenity effects over time.	resolve at an individual level.	
Option B: Modelled Setback	Highly efficient and effective. Utilising a model based on existing environmental conditions to calculate expected noise levels provides a more effective and efficient approach to setting the extent that a noise control should apply compared with Options C and D (both of which are 'standard width' controls regardless of local conditions).	A range of compliance and construction costs will apply when compared with Option A. These range from building and compliance design costs to meet permitted activity standards through to resource consent costs should standards not be complied with. The costs will fall on applicants and compliance confirmation costs will be borne by the regulatory authority and/or the applicant. Costs of mitigation have been independently assessed by Acoustic Engineering Services Limited ¹⁴ and indicate typically a 0% to 2% increase in construction cost for new dwellings and additions ¹⁵ in new materials. Waka Kotahi will also bear the cost of maintaining up to date modelling data to	Better human health outcomes as there will be less exposure to the causes of negative health and amenity outcomes when compared with Option A. Option B provides a comprehensive regulatory approach which recognises the spatial extent of road traffic noise based on environmental factors (eg traffic volume, topography, road surface, existing building locations). This will result in a more accurate reflection of the extent of likely effects than Options C or D. The provisions do not aim to achieve 'zero' health effects (which is the outcome sought by the WHO Guidelines). Rather, the Modelled Setback/Option B provisions provide for a balance between health and amenity protection, cost and regulatory administration.

¹⁴ **Attachment 3:** Acoustic Engineering Services Limited, Report Reference AC20063 – 01 – R2: Cost of traffic noise mitigation measures, 12 June 2020.

¹⁵ **Attachment 3:** Acoustic Engineering Services Limited, Report Reference AC20063 – 01 – R2: Cost of traffic noise mitigation measures, 12 June 2020.

Table 3: Alternative Option Assessment			
Option	Effectiveness and Efficiency	Costs	Benefits
		support noise contour line establishment.	
Option C: Metric Setback	<p>Moderately efficient and effective.</p> <p>Option provides a reasonable outcome but will 'capture' more sites than is necessary to be highly efficient.</p>	<p>Option C (especially where applied at 80m to 100m) is likely to affect a greater number of sites than Option B. It is a 'blanket' approach which does not reflect individual area conditions.</p> <p>Other costs are the same as for Option B.</p>	<p>Better human health outcomes as there will be reduced exposure to the causes of negative health and amenity outcomes when compared with Option A.</p> <p>Less costly to prepare (set distance rather than modelled) when compared with Option B.</p>
Option D: Yard provision	<p>Highly effective but not efficient.</p> <p>The 'no build' yard will provide a high level of health and amenity protection but does not result in an efficient use of land.</p>	Limits construction on particular areas of a site; high cost borne by land owners as sensitive activity development is limited in these areas.	Good human health outcomes as there will be a reduced number of sensitive activities exposed to the causes of negative health and amenity outcomes.
Option E: Notified Plan Provisions	This option [is / is not] effective and efficient, because [...]	[complete assessment if plan includes amenity provisions]	[complete assessment if plan includes amenity provisions]

4.1.2 Assessing reasonably practicable options

Based on the cost benefit analysis presented in Table 3, Table 4 summarises reasonably practicable options.

Table 4: Identifying Reasonably Practicable Options	
Option	Is it reasonably practicable?
<i>Option A: Do nothing</i> This option is currently applied in some District Plans.	✓
<i>Option B: Modelled Setback</i> Options similar to this are currently applied in some District Plans.	✓
<i>Option C: Metric Setback</i> Options similar to this are currently applied in some District Plans.	✓
<i>Option D: Yard requirement</i> Options similar to this are currently applied in some District Plans.	✓

<p>Option E: Notified Plan Provisions Describe if provisions are considered to be a reasonably practicable alternative. Check the Council's s32 report for reasons and address whether you agree or not</p>	<p>[* or ✓]</p>
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4.1.3 Preferred option

Based on the analysis in Table 3 and the reasonably practicable options identified in Table 4, Table 5 rates each of the reasonably practicable options.

Table 5: Preferred Option				
Least Preferred				Most Preferred
<p>Option A: Do Nothing.</p>	<p>Option E: Include notified provisions if applicable.</p>	<p>Option D: Yard setback</p>	<p>Option C.: Metric Setback</p>	<p>Option B: Modelled Setback</p>

For the reasons set out in Tables 3 and 4, the Modelled Setback/Option B is considered to be the most efficient and effective method for addressing the health and amenity effects of transport noise. In accordance with National Planning Standards¹⁶, should they be adopted, the provisions must be located in the district or city wide Noise chapter of the district / unitary plan.

Where there are Council proposed provisions and this is not the conclusion resulting from analysis, consider not utilising the s32 but instead making a submission to change Councils provisions.

5. Conclusion

The Modelled Setback/Option B is identified as the preferred approach to manage the potential health and amenity effects of transport network operations, and to and provide a reasonable and appropriate balance between cost and benefit. The provisions apply only where an existing noise-sensitive activity is extended or a new noise-sensitive activity is proposed adjacent to a designated transport corridor.

The Modelled Setback/Option B have been detailed and compared against a number of alternatives in terms of their costs, benefits, and efficiency and effectiveness in accordance with the relevant clauses of section 32 of the RMA.

The Modelled Setback/Option B are considered to represent the most appropriate means of achieving the proposed objective and of addressing the underlying resource management issues relating to the transport environment, human health and amenity.

¹⁶ The District-wide Matters National Planning Standard requires at 33 that: *If provisions for managing noise are addressed, they must be located in the Noise chapter. These provisions may include: ... c.sound insulation requirements for sensitive activities and limits to the location of those activities relative to noise generating activities.*

New or altered State highway transport projects will continue to be assessed under NZS 6806:2010 (Acoustics – Road traffic noise – New and altered roads).

Attachment 1: Provisions (Option B)

Objective 1

Protect sensitive activities from potential adverse health and amenity effects that may arise from designated state highway noise.

Policy 1

Locate and design new and altered buildings containing noise sensitive activities to minimise the potential for adverse effects from the designated state highway network.

Policy 2

Manage subdivision which could contain noise sensitive activities through setbacks, physical barriers and design controls to ensure subsequent development can be located, designed and constructed to minimise exposure to noise.

New Definition

Noise Sensitive Activity(s): Means any residential activity including visitor, student or retirement accommodation, educational activity including in any child care facility, healthcare activity and any congregations within places of worship/marae. Excludes those rooms used solely for the purposes of an entrance, passageway, toilet, bathroom, laundry, garage or storeroom.

1. Permitted Activity Rule Indoor Noise

- a. Within the Noise Corridor Boundary Overlay, where:
 - (i) a new building that contains a noise sensitive activity; or
 - (ii) an alteration to an existing building resulting in an increase in floor area of a noise sensitive activity; or
 - (iii) a new noise sensitive activity is located in an existing building;

is proposed, it is to be:

- (iv) Designed, constructed and maintained to achieve indoor design noise levels not exceeding the maximum values in Table 1; and
- (v) If windows must be closed to achieve the design noise levels in (1)(a)(i), the building is designed, constructed and maintained with a mechanical ventilation system that:
 - a. For habitable rooms for a residential activity, achieves the following requirements:
 - i. Provides mechanical ventilation to satisfy clause G4 of the New Zealand Building Code; and
 - ii. is adjustable by the occupant to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour; and
 - iii. provides relief for equivalent volumes of spill air; and
 - iv. provides cooling and heating that is controllable by the occupant and can maintain the inside temperature between 18°C and 25°C; and
 - v. does not generate more than 35 dB $L_{Aeq(30s)}$ when measured 1 metre away from any grille or diffuser.
 - b. For other spaces, is as determined by a suitably qualified and experienced person.

- c. A report is submitted by a suitably qualified and experienced person to the council demonstrating compliance with clauses (1)(a)(i) and (ii) above (as relevant) prior to the construction or alteration of any building containing an activity sensitive to noise.

Table 1

Occupancy/activity	Maximum road noise level ^{Note 1} L _{Aeq} (24h)
<i>Building type: Residential</i>	
Sleeping spaces	40 dB
All other habitable rooms	40 dB
<i>Building type: Education</i>	
Lecture rooms/theatres, music studios, assembly halls	35 dB
Teaching areas, conference rooms, drama studios, sleeping areas	40 dB
Libraries	45 dB
<i>Building type: Health</i>	
Overnight medical care, wards	40 dB
Clinics, consulting rooms, theatres, nurses' stations	45 dB
<i>Building type: Cultural</i>	
Places of worship, marae	35 B

Note 1: The design road noise is to be based on measured or predicted external noise levels plus 3 dB.

2. Permitted Activity Rule Outdoor Living Area

- a. Where an outdoor living or outdoor activity space required by another rule in the Plan is within the Noise Corridor Boundary Overlay and the outdoor space is required for a noise sensitive activity, the required outdoor living space is to be designed and maintained to achieve noise levels not exceeding the maximum values in Table 2; and
- b. A report is submitted by a suitably qualified and experienced person to the council demonstrating compliance with clauses (2)(a) above prior to the construction or alteration of the any building to which the outdoor living space relates.

Table 2

Activity	Maximum road noise level ^{Note 1} L _{Aeq} (24h)
Required Outdoor Living Space	57 dB

Note 1: The design road noise is to be based on measured or predicted external noise levels plus 3 dB.

3. Restricted Discretionary Activity Rule

Any new or altered noise sensitive activity which does not comply with Permitted Activity (1) or (2).

Restricted Discretionary Activity – Matters of Discretion

Discretion is restricted to:

- (a) Location of the building and outdoor living space;
- (b) The effects of the non-compliance on the health and amenity of occupants; and
- (c) The outcome of any consultation with Waka Kotahi NZ Transport Agency.

Restricted Discretionary Activity – Assessment Criteria

Discretion is restricted to:

- (a) Whether the location of the building minimises effects;
- (b) Alternative mitigation which manages the effects of the non-compliance on the health and amenity of occupants; and
- (c) The outcome of any consultation with Waka Kotahi NZ Transport Agency.

Attachment 2: Technical Basis of Noise Criterion

In preparing the Modelled Setback/Option B, Waka Kotahi has assessed existing research, standards and guidelines to guide selection of appropriate noise criteria.

Two documents are identified as providing national and international guidance and directives for transport noise: the WHO Europe Guidelines and NZS 6806:2010 *Acoustics – Road-traffic noise – New and altered roads* (NZS 6806).

In addition, AS/NZS 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors* (AS/NZS 2107) is a joint Australia and New Zealand standard which provides compliance measurement methods for background noise and recommends design criteria for occupied spaces.

WHO Europe Guideline

The WHO Europe Guidelines (the Guideline) contains key recommendations in regards to transport noise including:

Road¹⁷:

- For average noise exposure: recommends reducing noise levels produced by road traffic below 53 dB L_{den} ; and
- For night time exposure: recommends reducing noise levels produced by road traffic during night time below 45 dB L_{night} .

The WHO Europe document contains guidelines; it does not set a fixed standard. The Guideline has been prepared as an international research document and its outcomes need to be considered within the New Zealand statutory context before reference or inclusion in planning or policy documents. WHO guidance regarding effects of noise on health (more generally) are reflected in NZS 6806¹⁸.

NZS 6806:2010 Acoustics – Road-traffic noise – New and altered roads

NZS 6806 is the principal national document for management of noise in relation to new and altered roads. The purpose of NZS 6806 is to ensure noise effects on existing sensitive activities (described as Protected Premises and Facilities / PPFs) from new or altered roads are managed. It has been developed with the intention of being suitable to support RMA processes and to set reasonable noise criteria for road traffic noise (from new or altered roads) taking into account, among other things, health effects¹⁹.

NZS 6806 is a national standard, has been specifically developed for inclusion within an RMA framework, has been adopted into district plans and utilised in designations for the specific purpose of transport noise management. It is accepted as current good practice in regards to setting requirements which result in *reasonable* noise outcomes.

¹⁷ World Health Organisation, Environmental noise guidelines for the European region, 2018. Section 3.1.

¹⁸ NZS 6806 :2010 Section 4.7.1.

¹⁹ NZS 6806:2010 Acoustics – Road-traffic noise – New and altered roads, section 1.1.4.

NZS 6806 includes an external (“Category A”) noise criterion²⁰ for altered roads (64 dB $L_{Aeq(24h)}$), and two criteria for new roads depending on design year traffic volumes (64 dB $L_{Aeq(24h)}$ for higher volume roads and 57 dB $L_{Aeq(24h)}$ for lower volume roads).

Higher volume roads are those which, at design year, are predicted to carry greater than 75,000 AADT (Average Annual Daily Traffic). Lower volume roads are those which, at design year, are predicted to carry between 2,000 and 75,000 AADT.

Internal noise criterion²¹ for habitable spaces are set at 40 dB $L_{Aeq(24h)}$ for altered and new roads (regardless of AADT).

Analysis of 2018 AADT data²² shows the majority of existing state highways carry less than 75,000 AADT. It also indicates that only central parts of the Auckland motorway network currently have an AADT greater than 75,000.

While NZS 6806 applies to new and altered roads (ie. the onus is on the road controlling authority to manage effects), it provides strong guidance as to *reasonable* levels and expectations of noise levels in these environs. If these (<75,000 AADT) state highways were constructed (new) or altered in the current statutory environment, the lower level (57 dB $L_{Aeq(24h)}$) of the NZS 6806 external noise limits would be applied.

For road-traffic noise averaged over 24 hours, the internal 40 dB $L_{Aeq(24h)}$ criterion in residential habitable spaces from NZS 6806 represents a reasonable level as at night the level should reduce (as traffic volumes reduce) so as to avoid undue sleep disturbance.

AS/NZS 2107 Acoustics – Recommended design sound levels and reverberation times for building interiors

The scope of AS/NZS 2107 is to recommend criteria for healthy, comfortable and productive environments and it applies to steady-state or quasi-steady-state sounds. The Standard is ambiguous whether it should apply to transportation noise; regardless it provides an indication of reasonable internal levels for different types of sensitive activities. The criteria adopted in the Modelled Setback/Option B are generally consistent with AS/NZS 2107.

Conclusion

For the Modelled Setback/Option B, Waka Kotahi selected the NZS 6806 external level of 57 dB $L_{Aeq(24h)}$ and internal levels of between 35 dB $L_{Aeq(24h/1h)}$ and 45 dB $L_{Aeq(24h/1h)}$. This is because:

- a. the majority of state highway AADT fall within the lower AADT band for external noise within NZS 6806 (which requires external noise levels of 57 dB $L_{Aeq(24h)}$ for a new or altered road);
and

²⁰ NZS 6806:2010 Acoustics – Road-traffic noise – New and altered roads, Table 2 – Noise Criteria, A (primary free-field external noise criterion).

²¹ NZS 6806:2010 Acoustics – Road-traffic noise – New and altered roads, Table 2 – Noise Criteria, C (internal noise criterion).

²² <https://www.nzta.govt.nz/resources/state-highway-traffic-volumes/> 2018 data - *State highway volumes by region (in Excel format)*

- b. the outdoor noise exposure level of 57 dB and an indoor noise threshold near the top of the design range²³ in AS/NZS 2107:2016 (40 dB) have been selected as these levels are considered to provide a reasonable level of health and amenity protection but are not the most stringent.

²³ *top of the design range* means that the noise limit is at the upper level of range - ie. allows more noise rather than less.

Attachment 3: Building Cost Assessment



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Memorandum

To: Greg Haldane, Waka Kotahi
From: Clare Dykes, Acoustic Engineering Services
File Reference: AC20063 - 01 - R2
Date: Friday, 12 June 2020
Project: Cost of traffic noise mitigation measures
Pages: 6

Meeting

Telephone

Memorandum

File Note

Dear Greg,

In March 2020, Waka Kotahi NZ Transport Agency engaged Acoustic Engineering Services (AES) and O'Brien Quantity Surveying to undertake a study relating to the cost of traffic noise insulation measures. The project involved a review of a number of situations where traffic noise mitigation had been installed, including:

- Buildings which required upgrades to reduce traffic noise break-in as a result of their location in proximity to major roads, and;
- New residential neighbourhoods which were constructed near to major roads, where traffic noise barriers were integrated into the overall scheme design so that the upgrading of dwellings was no longer required (or was reduced) and noise in outdoor living areas was reduced.

This memorandum summarises the study, and the general trends visible in the results.

1.0 BUILDING UPGRADES

A common method of ensuring that noise from roads is not intrusive within buildings is to design the building envelope to provide a high level of sound insulation, and to provide a mechanical ventilation system so occupants do not need to open windows for cooling and fresh air.

The Christchurch District Plan contains a rule requiring the design of new noise sensitive buildings to be constructed in higher noise locations to include these sound insulation features. AES have previously completed a study related to the Christchurch District Plan sound insulation rule, which involved a review of the specific circumstances relating to a sample of building projects. The work described in this memo built on aspects of that previous study, and looked to quantify the cost of those building upgrades, to assist Waka Kotahi in understanding the potential financial implications of mandatory traffic noise insulation rules. A number of additional examples from various sources were added to the original sample, to increase the sample size and diversity.

We have also completed a review of the Proposed and Operative District Plans for the 67 New Zealand Districts. Two thirds of the District Plans throughout the country include requirements for sound insulation when dwellings are located in proximity to major roads. Of these, 10 % include a requirement which is very

similar to the Waka Kotahi Guidelines¹ centred around an internal noise level requirement of 40 dB L_{Aeq} (24 hour) in bedrooms and other habitable spaces, and the provision of mechanical ventilation. The remaining rules vary, with common variations including requiring different internal noise levels to be met, omitting any mechanical ventilation requirement (or a reduced mechanical ventilation requirement), and specifying a fixed level of sound insulation performance to be achieved by the building façade. As discussed below, all of these rule variations have a different cost impact.

1.1 The sample

A total of 58 buildings were considered for inclusion in the analysis. However, detailed costings were only completed on 23 of these, primarily because:

- A number of the building projects successfully obtained a Resource Consent to legitimise a partial or complete non-compliance with the relevant sound insulation rule, and so these results would not have assisted with understanding the cost of compliance.
- For a number of the building projects there was not sufficient publicly available information to complete an accurate costing.

The final 23 building projects included 11 detached residential dwellings, seven multi-residential units (such as terraced houses and duplexes), and five apartment buildings. These buildings were expected to experience worst-case traffic noise levels ranging from 55 dB L_{Aeq} (24 hours) to 71 dB L_{Aeq} (24 hours).

As discussed above, a variety of sound insulation rules are encountered throughout the country. The building projects in the sample had been assessed against the following rules:

- 12 of the sample has been assessed against a requirement which is similar to that described in the Waka Kotahi Guidelines, including an internal noise level requirement of 40 dB L_{Aeq} (24 hour) in bedrooms and other habitable spaces, and the provision of mechanical ventilation.
- Two of the sample were assessed using a rule which has a different internal noise level requirement with no mechanical ventilation required.
- Eight of the sample were assessed against rule with a façade reduction requirement or a provided set of constructions intended to provide a fixed façade reduction, and no mechanical ventilation required.
- One involved review against an internal noise level requirement of 40 dB L_{Aeq} (24 hours) for some spaces, and a façade reduction requirement for others.

Overall, the sample was relatively small – however a moderate number of examples could be assessed against a rule similar to that preferred by Waka Kotahi. Otherwise the variety within the sample is typical of the variety in sound insulation rules encountered in New Zealand.

Challenges of extending the sample included the lack of a centralised database to use for establishing a list of building projects of potential interest, and then the lack of availability of publicly available information for projects which provides sufficient detail for accurate costings.

1.2 Assumptions

Key assumptions embodied in this part of the study are as follows:

¹ Waka Kotahi NZ Transport Agency, *Guide to the management of effects on noise sensitive land use near to the state highway network*, Version 1.0, September 2015

- The reported external noise levels are based on the available traffic numbers, road surface, and speed information for the road adjacent to the building project site at the time, and are for the most exposed building façade.
- The upgrades that were recommended by the acoustic engineers involved in each case were installed and alternative systems were not used.
- The systems where not specified were originally 10 mm Standard Gib plasterboard internal linings for walls, and 13 mm Standard Gib plasterboard linings for ceilings, and 4 mm float glass / 12 mm air space / 4 mm float glass for glazing.
- Where 7 mm Ecoply RAB board was specified for external walls it was assumed that this would have been included regardless of the acoustic upgrades, and so was not included in the upgrade costing.
- Where not specified, the mechanical ventilation system was assumed to be of similar or equal design and performance to those projects where this detail was provided.

1.3 Findings

We have summarised a number of key observations from the analysis below.

Table 1.1 outlines the increase in overall building cost associated with any upgrades to the building façade and/or the installation of mechanical ventilation system, to ensure compliance with the various sound insulation rules.

Table 1.1 – Summary of cost of traffic noise mitigation by building type

Building Type	Range of external noise levels (dB L _{Aeq} (24 hours))	Increase in overall cost of building (per residential unit)	Percentage increase in overall cost of building
Detached residential	55 – 68	\$0 – \$16,000	0 – 2 %
Residential units	58 – 69	\$500 – \$15,000	0 – 2 %
Apartment buildings	60 – 71	\$500 – \$16,000	0 – 1 %

These results illustrate that the overall percentage increase in building cost due to compliance with a sound insulation rule was 2 % or less (noting that none of the buildings in the sample were exposed to external traffic noise levels exceeding 71 dB L_{Aeq}(24 hour)).

For the residential units and apartment buildings, the figures in table 1.1 are based on the total cost of upgrades, divided by the total number of residential units in the development. However, some units did not require any upgrades, as they experience lower external noise levels. If the total cost of upgrades is only divided by the number of units in the development which required upgrading, the percentage increase changes to 1 – 4 %.

In table 1.2 the results are presented based on the type of sound insulation rule that the assessment was undertaken against.

Table 1.2 – Summary of cost of traffic noise mitigation by rule type

Rule	Range of external noise levels (dB L _{Aeq} (24 hours))	Increase in overall cost of building per residential unit	Percentage increase in overall cost of building
Internal noise level of 40 dB L _{Aeq} (24 hours) and mechanical ventilation	55 – 71	\$0 – \$16,000	0 – 2 %
Alternative internal noise level requirement, no mechanical ventilation	64 – 65	\$500 – \$1,500	0 – 1 %
Façade reduction requirement or defined constructions, and no mechanical ventilation	55 – 69	\$0 – \$16,000	0 – 2 %

This summary appears to indicate that the costs associated with both the internal noise level and façade reduction rules are similar (noting that the sample size for the ‘alternative internal noise level requirement, no mechanical ventilation’ rule was very small, and the external levels were moderate). However, we note the following:

- For the methods which used internal noise levels, the increase in costs is very dependent on the external noise level. The developments which resulted in upgrade costs of less than 1 % typically experienced external noise levels below 65 dB L_{Aeq} (24 hours). There are exceptions to this depending on the layout of the units.
- While the ‘façade reduction requirement or defined constructions’ rules appear to attract a similar cost to the ‘internal noise level’ rules, those particular rules did not require mechanical ventilation to be installed. Occupants in some situations would therefore have still had to choose between thermal comfort, and noise. Additional cost should have been involved with installing mechanical ventilation in those situations, as was the case for the ‘internal noise level of 40 dB L_{Aeq} (24 hours) and mechanical ventilation’ examples. To put it another way, the cost may be similar, but the benefit is likely to have been less in many cases.
- The required construction upgrades (and therefore the costs) of the ‘façade reduction requirement or a defined set constructions’ rules are not dependent on external noise levels. This means that while the range of cost increases is similar, in some situations the high costs lead to no benefit, as the external noise levels were low. For the ‘internal noise level of 40 dB L_{Aeq} (24 hours) and mechanical ventilation’ examples where the costs were high, that was at least in response to high external noise levels and so was justified.

For a small number of developments, no upgrades were required as either external traffic noise levels were very low, or the original design included high mass cladding with small window areas on key facades.

2.0 BARRIERS

An alternative method for reducing the levels of road traffic noise experienced by the occupants of new dwellings is for a barrier to be installed to screen a new residential neighbourhood from the road. This means that individual dwellings are less likely to need to be upgraded, and noise levels in outdoor living areas are also reduced. However, the developer of the new neighbourhood is likely to primarily bear the cost of the barrier, compared to the building upgrades discussed in section 1.0 above, which are paid for by the individual building owners.

2.1 The sample

10 new residential neighbourhoods were included in the analysis. All of these adjoined State Highways and were likely to have been designed with some regard to the Waka Kotahi Guidelines. Each of the neighbourhoods had been screened from the State Highway with a traffic noise barrier, including:

- Seven examples with ‘acoustic’ fences ranging in height from 2 – 3 metres
- Two examples where earth bunds had been constructed – these were 2 – 3 metres in height, and 8 – 9 metres wide
- One example with a combination of acoustic fencing and earth bund

For each example, we determined the number of dwellings which would have experienced traffic noise levels of greater than 57 dB $L_{Aeq}(24\text{ hours})$ without a barrier. These dwellings would have been the most likely to have required upgrading had the barrier not been constructed, in order to satisfy a traffic noise insulation rule of the type discussed in section 1.0 above. We note that it is possible that some dwellings still required upgrading even with the barrier – for example the upper level of two-storey houses. As above, the barrier also reduces the noise levels in outdoor living areas associated with dwellings – which is a benefit compared to the sound insulation rules discussed in section 1.0, which only modifies the environment within a dwelling.

The number of dwellings which would have experienced traffic noise levels of greater than 57 dB $L_{Aeq}(24\text{ hours})$ without a barrier ranged from 1 through to 120. The number of affected lots was dependent on the overall layout of the subdivision relative to the road, as well as the traffic numbers, road surface, and speed.

2.2 Assumptions

Key assumptions were as follows:

- The acoustic fences were constructed of 125 x 75 mm H4 posts, 75 x 50 mm H3 railings, 150 x 25 mm H3 palings with 50 x 25 mm H3 battens over joins and 150 x 50 mm H3 capping.
- In some cases, the effective height of fences was increased, because they were constructed on top of a retaining wall. It was assumed that the retaining walls would have been required for general site levelling and not specifically to enhance the acoustic effectiveness of the barrier. This was therefore not included within the upgrade cost.
- It was assumed that the subdivision layout without the barrier would have been exactly the same. In reality larger setback distances or other rearrangement of the layout may have been included if the traffic noise had not been largely mitigated by the barrier.
- The earth bund was assumed to be constructed with surplus excavated soil from the site, with a layer of imported topsoil 150 mm thick spread on top for grass.

2.3 Findings

We have summarised a number of key observations from the analysis below.

Table 2.1 shows the cost of each barrier, divided by the number of dwellings which would have experienced a noise level of greater than 57 dB $L_{Aeq}(24\text{ hours})$ without a barrier. We have grouped the results together for different barrier types, and have also shown the situations where are large and small number of dwellings benefited from the barrier separately.

Table 2.1 – Summary of cost of traffic noise mitigation by barrier type

Barrier Type	Approximate number of dwellings which benefited from barrier	Cost of barrier per dwelling
Acoustic fence	1 - 10	\$15,000 - \$30,000
	30	\$10,000
	80 - 110	\$3,000 - \$5,000
Earth bund	10	\$60,000
	50	\$6,000
Combination	120	\$4,000

Overall, this analysis shows that when the number of affected dwellings is low (i.e. the layout results in few lots near the road, or the volume of traffic is low etc.) the overall cost per dwelling is high. When these absolute costs are viewed as a percentage of the likely final value of each of the affected sections, the range is from 2 % (acoustic fence, benefiting a large number of sections) to 30 % (earth bund, benefiting a few sections). As above, in all of these examples for dwellings constructed on these sections, additional costs in the order of those presented in tables 1.1 and 1.2 above would be largely avoided, and traffic noise levels in outdoor living areas would also be reduced.

We note that a key decision in the above analysis is whether the loss of the land under the footprint of any earth bund is included as a 'cost'. In all of the examples the bund fell within an area which was ultimately sold to a homeowner as part of a site, or was within an area close to the State Highway which was unlikely to have been developed for residential use regardless – so the loss of the land under the bund has not been included as a cost. As an example, for the development with approximately 50 affected dwellings, if the cost of the land under the bund was included in the analysis, the total cost as a percentage of the likely final value of each of the affected sections would increase from 3 % to 16 %.

We trust this is of assistance. If you have any queries, please do not hesitate to contact us.

Kind Regards



Clare Dykes
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Pros:

With buffering you will still keep the general shape of the line and have a consistent distance along the entire contour. This can be easily built into models and automated for the entire country.

Cons:

The negatives of this techniques are you still get some unwanted bends/curves, despite an overall more consistent line. The result of a buffer is an area (polygon), so there are two small steps to convert the polygon into a line, then erase the original line to give one new contour line. The other downside is you push the line out (i.e. needlessly increasing the extent of the contour) in a large proportion of areas where it is already smooth, unlike the smoothing and simplifying methods detailed later in this memo. This can be negated relatively simply by offsetting the line back by buffering the results by the same amount as the original buffer but back towards the original line.

Overall, this is a viable option for your needs, but the main issue would be deciding on the appropriate distance to buffer. Buffering could be used in conjunction with the other methods to provide both a smooth and conservative contour line from the raw modelling results.

As discussed in our meeting, this can be done in ArcGIS, FME and QGIS, but I would only recommend ArcGIS or FME for this task and to allow for integration with automation/existing models. More detail is available from ArcGIS provider ESRI: <https://pro.arcgis.com/en/pro-app/latest/tool-reference/analysis/buffer.htm>.

Simplify Line

Simplify Line simplifies a line by removing points along the line and therefore unwanted bends/curves, while preserving its shape (depending on the degree of simplification set known as **the tolerance**).

There are four available methods, when using ArcGIS Pro, the two most viable for this task are 'Wang-Muller' which retains critical bends and 'Zhou-Jones' which retains the weighted-effective areas. I have included the 'Wang-Muller' method on the 56 dB contour in Figure 2 below, with tolerance set at 10 metres and 50 metres.



The Zhou-Jones method needs lower tolerance set in general, as the results of the simplify tool can vary quite a lot from the original line.

Simplify Line with a Barrier

Simplify Line includes an option of having a barrier, which is another layer or feature can be used to prevent the main simplify line touching or crossing the barrier.



Figure 3 shows how this can be used. The Red line is the decibel (dB) 57 contour, it is included in the method as a barrier, to prevent the simplify line from the 56 dB contour line going across the 57 dB contour. The light Blue line has a tolerance of 50 metres and the dark blue line only has 10 metres tolerance. This should prove very useful when it comes to proving a planning line from noise contours.

Pros:

With simplifying you can set a tolerance to keep very true to the original contour line or really simplify it by setting a higher tolerance to cut out unwanted bends. The barrier should enable more sensible results by preventing modelled results of higher noise to be cut off by smoothing. You will keep the general shape of the line and where the line is already smooth or at least simply the line will match the modelled raw output. This can be easily built into models and automated for the entire country.

Cons

The negatives of this techniques are you still get some unwanted bends, but this can be overcome by adjusting tolerance to suit your wanted outcomes.

Overall, again this is a viable option for your needs, but the main issue would be deciding on the appropriate tolerance distance and barrier location.

More detail is available from ArcGIS provider ESRI: <https://pro.arcgis.com/en/pro-app/latest/tool-reference/cartography/simplify-line.htm>

Smooth Line

Smoothing lines removes the sharper angles with two main methods or algorithms. The Bezier interpolation method and the Polynomial Approximation with Exponential Kernel (PAEK) method. The Bezier method smooths the lines without using a tolerance, so it is not as viable for this task. The PAEK method, which like the simplify line tool allows you to set the tolerance, although the line may actually be more complicated, or have more points along it, which is something to think about for a national dataset. I have demonstrated the results of the PAEK method in Figure 4 below. The tolerance distance in metres can easily be modified based and barriers are also an option.



The Figure shows how the difference in the two tolerance values of 10 metres and 50 metres can vary greatly, where the 50 metre tolerance varies a lot from the original contour line.

Pros:

With smoothing you can keep use barriers and set tolerance. This can be easily built into models and automated for the entire country.

Cons

The negatives of this techniques are you may find it moves too much from the original contour. The valleys/peaks are removed, so you can get an overall more consistent line. The other downside is you again will have to set a tolerance that suits, and the line will move if that tolerance is pushed out or has higher values.

Overall, this could be a viable option for your needs, but the main issue would be deciding on the appropriate distance of tolerance.

As discussed in our meeting, this can be done in ArcGIS, FME and QGIS, but I would only recommend ArcGIS or FME for this task and to allow for integration with automation/existing models. More detail is available from ArcGIS provider ESRI: <https://pro.arcgis.com/en/pro-app/latest/tool-reference/cartography/smooth-line.htm>.

3-May-21

Attachment 5: Other Options Considered

For completeness, Waka Kotahi has also considered methods outside of the district plan to manage the issue; these include both regulatory (Building Code; National Environmental Standard) and private covenants (“no complaints” covenants) and built responses:

Regulatory

The **Building Act** (and Code) currently provides specifications to manage inter-tenancy noise (eg noise between residential apartments within the same building with shared tenancy walls). It does not, however, provide requirements for management of noise generated from outside a building (eg transport noise or nightclub noise from a separate building). A change to the Building Code would be needed to address the issue. While proposals for relevant changes to Clause G6 of the Building Code were circulated in 2016 and remain on MBIE’s work programme, these are not imminent.

A **National Environmental Standard** (NES) would require promulgation by central government, there is no current plan to promulgate RMA-based national planning direction in relation to health and amenity effects relative to transport.

There are situations where **covenants** are entered into where parties acknowledge and accept particular types of effects in return for locating in an area; commonly referred to as “no complaints” covenants. There are a number of limitations with this approach:

- a. it does not remove the actual effects on health and amenity therefore does not address the matters within Part 2 of the RMA;
- b. it is reliant on both parties coming to agreement;
- c. application of a covenant requires a ‘trigger’ to commence negotiations (eg. a request from a resource consent applicant to undertake works).

The primary limitation is however that it does not address actual health and amenity impacts.

Changes to the Building Act or promulgation of a NES are not directly within the control of Waka Kotahi; covenants require a ‘trigger’, agreement between parties and do not actually address the effects generated. None of these options are preferred.

Built Response

Waka Kotahi has undertaken a preliminary assessment of noise improvements across its network. It estimates a cost of at least \$150M²⁴ to retrospectively manage noise exposure for approximately 50% of persons exposed to noise above 64 dB $L_{Aeq(24h)}$.

Responses could include retrofitting acoustic barriers and/or installing low noise road surfaces.

Retrofitting noise barriers by motorways by Waka Kotahi has been found to cost in the range of \$4,000 to \$10,000 per linear metre of barrier. Construction of noise fences by individuals or land developers generally have lower costs.

Retrofitting acoustic barriers has a number of limitations:

- available land and/or ground conditions;

²⁴ Not currently funded.

- potential visual dominance and shading;
- ongoing maintenance costs (eg graffiti, landscape maintenance); and
- may not be effective for buildings of more than one storey.

There are also some benefits:

- for barriers close to buildings (or close to the road) and comprehensively blocking the line-of-sight of sensitive land uses to the state highway carriageway, a reduction of 5-10 dB can be achieved;
- where applied to large land areas, cost of protecting multiple sites will aggregate to be less than cost of protecting a low number of sites;
- reduces the need for individuals building houses to have to consider road noise or to keep windows closed;
- can provide visual screening giving a benefit in reducing both perception of noise and actual noise level; and
- can provide improved amenity for outdoor areas.

A porous asphalt surface (low noise road surface) would be in the order of \$30+/m² (standard two coat chipseal surface would be in the order of \$6/m² to \$10/m²). It cannot generally be laid directly on existing roads, because low noise (asphaltic) road surfaces require stiff underlying pavements, otherwise they fail prematurely. For much of the existing network, laying new asphaltic surfaces therefore first requires rebuilding of the structural pavement, which would increase the cost to over \$100/m². Low noise road surfaces can provide in the order of 5 dB reduction in noise generated from the tyre/road interface (although will not materially alter other sounds such as truck engine/air-braking noise). For traffic at highway speeds this is a meaningful improvement, although is often not sufficient to reduce sound to below guideline values.

Overall, while both built options provide some benefits, both options have significant costs and result in the full cost being borne by the road controlling authority in situations where the noise sensitive activity establishes after the state highway.